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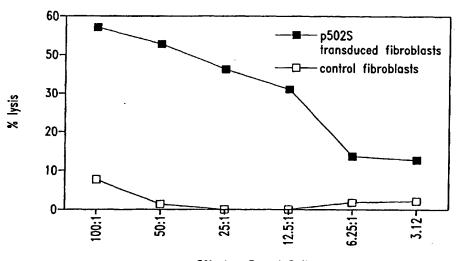
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(54) Title: COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER



Effector: Target Ratio

(57) Abstract: Compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer, are disclosed. Compositions may comprise one or more prostate-specific proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a prostate-specific protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as prostate cancer. Diagnostic methods based on detecting a prostate-specific protein, or mRNA encoding such a protein, in a sample are also provided.



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# COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER

#### 5 TECHNICAL FIELD

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The present invention relates generally to therapy and diagnosis of cancer, such as prostate cancer. The invention is more specifically related to polypeptides comprising at least a portion of a prostate-specific protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of prostate cancer, and for the diagnosis and monitoring of such cancers.

# **BACKGROUND OF THE INVENTION**

Prostate cancer is the most common form of cancer among males, with an estimated incidence of 30% in men over the age of 50. Overwhelming clinical evidence shows that human prostate cancer has the propensity to metastasize to bone, and the disease appears to progress inevitably from androgen dependent to androgen refractory status, leading to increased patient mortality. This prevalent disease is currently the second leading cause of cancer death among men in the U.S.

In spite of considerable research into therapies for the disease, prostate cancer remains difficult to treat. Commonly, treatment is based on surgery and/or radiation therapy, but these methods are ineffective in a significant percentage of cases. Two previously identified prostate specific proteins - prostate specific antigen (PSA) and prostatic acid phosphatase (PAP) - have limited therapeutic and diagnostic potential. For example, PSA levels do not always correlate well with the presence of prostate cancer, being positive in a percentage of non-prostate cancer cases, including benign prostatic hyperplasia (BPH). Furthermore, PSA measurements correlate with prostate volume, and do not indicate the level of metastasis.

In spite of considerable research into therapies for these and other cancers, prostate cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

## 30 SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the

diagnosis and therapy of cancer, such as prostate cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a prostate-specific protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises at least an immunogenic portion of a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in any one of SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382,384-476, 524, 526, 530, 531, 533, 535 and 536; (b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and (c) complements of any of the sequence of (a) or (b). In certain specific embodiments, such a polypeptide comprises at least a portion, or variant thereof, of a protein that includes an amino acid sequence selected from the group consisting of sequences recited in any one of SEQ ID NO: 112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534, 537-550.

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a prostate-specific protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines for prophylactic or therapeutic use are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a prostate-specific protein; and (b) a physiologically acceptable carrier. In certain embodiments, the present invention provides monoclonal antibodies that specifically bind to an amino acid sequence selected from the group consisting of SEQ ID NO: 496, 504, 505, 509-517, 522 and 541-550, together with monoclonal antibodies comprising a complementarity determining region selected from the group consisting of SEQ ID NO: 502, 503 and 506-508.

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Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate-specific protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a prostate-specific protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polypucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

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Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a prostate-specific protein; (ii) a polypucleotide encoding such a polypeptide; and (iii) an antigenpresenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

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Within further aspects, the present invention provides methods for determining the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be prostate cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain

embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

## BRIEF DESCRIPTION OF THE DRAWINGS AND SEQUENCE IDENTIFIERS

Figure 1 illustrates the ability of T cells to kill fibroblasts expressing the representative prostate-specific polypeptide P502S, as compared to control fibroblasts. The percentage lysis is shown as a series of effector:target ratios, as indicated.

Figures 2A and 2B illustrate the ability of T cells to recognize cells expressing the representative prostate-specific polypeptide P502S. In each case, the number of γ-interferon spots is shown for different numbers of responders. In Figure 2A, data is presented for fibroblasts pulsed with the P2S-12 peptide, as compared to fibroblasts pulsed with a control E75 peptide. In Figure 2B, data is presented for fibroblasts expressing P502S, as compared to fibroblasts expressing HER-2/neu.

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Figure 3 represents a peptide competition binding assay showing that the P1S#10 peptide, derived from P501S, binds HLA-A2. Peptide P1S#10 inhibits HLA-A2 restricted presentation of fluM58 peptide to CTL clone D150M58 in TNF release bioassay. D150M58 CTL is specific for the HLA-A2 binding influenza matrix peptide fluM58.

Figure 4 illustrates the ability of T cell lines generated from P1S#10 immunized mice to specifically lyse P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat A2Kb targets, as compared to EGFP-transduced Jurkat A2Kb. The percent lysis is shown as a series of effector to target ratios, as indicated.

Figure 5 illustrates the ability of a T cell clone to recognize and specifically lyse Jurkat A2Kb cells expressing the representative prostate-specific polypeptide P501S, thereby demonstrating that the P1S#10 peptide may be a naturally processed epitope of the P501S polypeptide.

Figures 6A and 6B are graphs illustrating the specificity of a CD8<sup>+</sup> cell line (3A-1) for a representative prostate-specific antigen (P501S). Figure 6A shows the results of a <sup>51</sup>Cr release assay. The percent specific lysis is shown as a series of effector:target ratios, as indicated. Figure 6B shows the production of interferon-gamma by 3A-1 cells stimulated with autologous B-LCL transduced with P501S, at varying effector:target rations as indicated.

Figure 7 is a Western blot showing the expression of P501S in baculovirus.

Figure 8 illustrates the results of epitope mapping studies on P501S.

Figure 9 is a schematic representation of the P501S protein showing the location of transmembrane domains and predicted intracellular and extracellular domains.

Figure 10 is a genomic map showing the location of the prostate genes P775P, P704P, B305D, P712P and P774P within the Cat Eye Syndrome region of chromosome 22q11.2

Figure 11 shows the results of an ELISA assay of antibody specificity to P501S peptides.

SEQ ID NO: 1 is the determined cDNA sequence for F1-13

SEQ ID NO: 2 is the determined 3' cDNA sequence for F1-12

SEQ ID NO: 3 is the determined 5' cDNA sequence for F1-12

SEQ ID NO: 4 is the determined 3' cDNA sequence for F1-16

SEQ ID NO: 5 is the determined 3' cDNA sequence for H1-1

SEQ ID NO: 6 is the determined 3' cDNA sequence for H1-9

SEQ ID NO: 7 is the determined 3' cDNA sequence for H1-4

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SEQ ID NO: 8 is the determined 3' cDNA sequence for J1-17 SEQ ID NO: 9 is the determined 5' cDNA sequence for J1-17 SEQ ID NO: 10 is the determined 3' cDNA sequence for L1-12 SEQ ID NO: 11 is the determined 5' cDNA sequence for L1-12 SEQ ID NO: 12 is the determined 3' cDNA sequence for N1-1862 SEQ ID NO: 13 is the determined 5' cDNA sequence for N1-1862 SEQ ID NO: 14 is the determined 3' cDNA sequence for J1-13 SEQ ID NO: 15 is the determined 5' cDNA sequence for J1-13 SEQ ID NO: 16 is the determined 3' cDNA sequence for J1-19 SEQ ID NO: 17 is the determined 5' cDNA sequence for J1-19 SEQ ID NO: 18 is the determined 3' cDNA sequence for J1-25 SEQ ID NO: 19 is the determined 5' cDNA sequence for J1-25 SEQ ID NO: 20 is the determined 5' cDNA sequence for J1-24 SEQ ID NO: 21 is the determined 3' cDNA sequence for J1-24 SEQ ID NO: 22 is the determined 5' cDNA sequence for K1-58 SEQ ID NO: 23 is the determined 3' cDNA sequence for K1-58 SEQ ID NO: 24 is the determined 5' cDNA sequence for K1-63 SEQ ID NO: 25 is the determined 3' cDNA sequence for K1-63 SEQ ID NO: 26 is the determined 5' cDNA sequence for L1-4 SEQ ID NO: 27 is the determined 3' cDNA sequence for L1-4 20 SEQ ID NO: 28 is the determined 5' cDNA sequence for L1-14 SEQ ID NO: 29 is the determined 3' cDNA sequence for L1-14 SEQ ID NO: 30 is the determined 3' cDNA sequence for J1-12 SEQ ID NO: 31 is the determined 3' cDNA sequence for J1-16 25 SEQ ID NO: 32 is the determined 3' cDNA sequence for J1-21 SEQ ID NO: 33 is the determined 3' cDNA sequence for K1-48 SEQ ID NO: 34 is the determined 3' cDNA sequence for K1-55 SEQ ID NO: 35 is the determined 3' cDNA sequence for L1-2 SEQ ID NO: 36 is the determined 3' cDNA sequence for L1-6 SEQ ID NO: 37 is the determined 3' cDNA sequence for N1-1858 30 SEQ ID NO: 38 is the determined 3' cDNA sequence for N1-1860 SEQ ID NO: 39 is the determined 3' cDNA sequence for N1-1861

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SEQ ID NO: 104 is the determined cDNA sequence for 1D-4304

SEQ ID NO: 105 is the determined cDNA sequence for 1D-4296

SEQ ID NO: 106 is the determined cDNA sequence for 1D-4280

SEQ ID NO: 107 is the determined full length cDNA sequence for F1-12 (also referred to as P504S)

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SEQ ID NO: 108 is the predicted amino acid sequence for F1-12

SEQ ID NO: 109 is the determined full length cDNA sequence for J1-17

SEQ ID NO: 110 is the determined full length cDNA sequence for L1-12 (also referred to as P501S)

SEQ ID NO: 111 is the determined full length cDNA sequence for N1-1862 (also referred to as

10 P503S)

SEQ ID NO: 112 is the predicted amino acid sequence for J1-17

SEQ ID NO: 113 is the predicted amino acid sequence for L1-12 (also referred to as P501S)

SEQ ID NO: 114 is the predicted amino acid sequence for N1-1862 (also referred to as P503S)

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SEQ ID NO: 212 is the determined cDNA sequence for 8-b5fwd

SEQ ID NO: 213 is the determined cDNA sequence for 8-b5rev

SEQ ID NO: 214 is the determined cDNA sequence for 8-b6fwd

SEQ ID NO: 215 is the determined cDNA sequence for 8-b6 rev

SEQ ID NO: 216 is the determined cDNA sequence for 8-d4fwd

SEQ ID NO: 217 is the determined cDNA sequence for 8-d9rev

SEQ ID NO: 218 is the determined cDNA sequence for 8-g3fwd

SEQ ID NO: 219 is the determined cDNA sequence for 8-g3rev

SEQ ID NO: 220 is the determined cDNA sequence for 8-h11rev

SEQ ID NO: 221 is the determined cDNA sequence for g-f12fwd

25 SEQ ID NO: 222 is the determined cDNA sequence for g-f3rev

SEQ ID NO: 223 is the determined cDNA sequence for P509S

SEQ ID NO: 224 is the determined cDNA sequence for P510S

SEQ ID NO: 225 is the determined cDNA sequence for P703DE5

SEQ ID NO: 226 is the determined cDNA sequence for 9-A11

30 SEQ ID NO: 227 is the determined cDNA sequence for 8-C6

SEQ ID NO: 228 is the determined cDNA sequence for 8-H7

SEQ ID NO: 229 is the determined cDNA sequence for JPTPN13

15

SEQ ID NO: 230 is the determined cDNA sequence for JPTPN14 SEQ ID NO: 231 is the determined cDNA sequence for JPTPN23 SEQ ID NO: 232 is the determined cDNA sequence for JPTPN24 SEQ ID NO: 233 is the determined cDNA sequence for JPTPN25 SEQ ID NO: 234 is the determined cDNA sequence for JPTPN30 SEQ ID NO: 235 is the determined cDNA sequence for JPTPN34 SEO ID NO: 236 is the determined cDNA sequence for PTPN35 SEQ ID NO: 237 is the determined cDNA sequence for JPTPN36 SEQ ID NO: 238 is the determined cDNA sequence for JPTPN38 SEQ ID NO: 239 is the determined cDNA sequence for JPTPN39 SEQ ID NO: 240 is the determined cDNA sequence for JPTPN40 SEQ ID NO: 241 is the determined cDNA sequence for JPTPN41 SEQ ID NO: 242 is the determined cDNA sequence for JPTPN42 SEQ ID NO: 243 is the determined cDNA sequence for JPTPN45 SEQ ID NO: 244 is the determined cDNA sequence for JPTPN46 SEQ ID NO: 245 is the determined cDNA sequence for JPTPN51 SEQ ID NO: 246 is the determined cDNA sequence for JPTPN56 SEQ ID NO: 247 is the determined cDNA sequence for PTPN64 SEQ ID NO: 248 is the determined cDNA sequence for JPTPN65 SEQ ID NO: 249 is the determined cDNA sequence for JPTPN67 20 SEQ ID NO: 250 is the determined cDNA sequence for JPTPN76 SEQ ID NO: 251 is the determined cDNA sequence for JPTPN84 SEQ ID NO: 252 is the determined cDNA sequence for JPTPN85 SEQ ID NO: 253 is the determined cDNA sequence for JPTPN86 SEQ ID NO: 254 is the determined cDNA sequence for JPTPN87 25 SEQ ID NO: 255 is the determined cDNA sequence for JPTPN88 SEQ ID NO: 256 is the determined cDNA sequence for JP1F1 SEQ ID NO: 257 is the determined cDNA sequence for JP1F2 SEQ ID NO: 258 is the determined cDNA sequence for JP1C2 SEQ ID NO: 259 is the determined cDNA sequence for JP1B1 30 SEQ ID NO: 260 is the determined cDNA sequence for JP1B2 SEQ ID NO: 261 is the determined cDNA sequence for JP1D3

SEQ ID NO: 262 is the determined cDNA sequence for JP1A4 SEQ ID NO: 263 is the determined cDNA sequence for JP1F5 SEQ ID NO: 264 is the determined cDNA sequence for JP1E6 SEQ ID NO: 265 is the determined cDNA sequence for JP1D6 SEQ ID NO: 266 is the determined cDNA sequence for JP1B5 SEQ ID NO: 267 is the determined cDNA sequence for JP1A6 SEQ ID NO: 268 is the determined cDNA sequence for JP1E8 SEQ ID NO: 269 is the determined cDNA sequence for JP1D7 SEQ ID NO: 270 is the determined cDNA sequence for JP1D9 10 SEQ ID NO: 271 is the determined cDNA sequence for JP1C10 SEQ ID NO: 272 is the determined cDNA sequence for JP1A9 SEQ ID NO: 273 is the determined cDNA sequence for JP1F12 SEQ ID NO: 274 is the determined cDNA sequence for JP1E12 SEQ ID NO: 275 is the determined cDNA sequence for JP1D11 SEQ ID NO: 276 is the determined cDNA sequence for JP1C11 15 SEQ ID NO: 277 is the determined cDNA sequence for JP1C12 SEQ ID NO: 278 is the determined cDNA sequence for JP1B12 SEQ ID NO: 279 is the determined cDNA sequence for JP1A12 SEQ ID NO: 280 is the determined cDNA sequence for JP8G2 20 SEQ ID NO: 281 is the determined cDNA sequence for JP8H1 SEQ ID NO: 282 is the determined cDNA sequence for JP8H2 SEQ ID NO: 283 is the determined cDNA sequence for JP8A3 SEQ ID NO: 284 is the determined cDNA sequence for JP8A4 SEQ ID NO: 285 is the determined cDNA sequence for JP8C3 SEQ ID NO: 286 is the determined cDNA sequence for JP8G4 SEQ ID NO: 287 is the determined cDNA sequence for JP8B6 SEQ ID NO: 288 is the determined cDNA sequence for JP8D6 SEQ ID NO: 289 is the determined cDNA sequence for JP8F5 SEQ ID NO: 290 is the determined cDNA sequence for JP8A8 SEQ ID NO: 291 is the determined cDNA sequence for JP8C7 30 SEQ ID NO: 292 is the determined cDNA sequence for JP8D7 SEQ ID NO: 293 is the determined cDNA sequence for P8D8

- SEQ ID NO: 294 is the determined cDNA sequence for JP8E7
- SEQ ID NO: 295 is the determined cDNA sequence for JP8F8
- SEQ ID NO: 296 is the determined cDNA sequence for JP8G8
- SEQ ID NO: 297 is the determined cDNA sequence for JP8B10
- SEQ ID NO: 298 is the determined cDNA sequence for JP8C10
  - SEQ ID NO: 299 is the determined cDNA sequence for JP8E9
  - SEQ ID NO: 300 is the determined cDNA sequence for JP8E10
  - SEQ ID NO: 301 is the determined cDNA sequence for JP8F9
  - SEQ ID NO: 302 is the determined cDNA sequence for JP8H9
- SEQ ID NO: 303 is the determined cDNA sequence for JP8C12
  - SEQ ID NO: 304 is the determined cDNA sequence for JP8E11
  - SEQ ID NO: 305 is the determined cDNA sequence for JP8E12
  - SEQ ID NO: 306 is the amino acid sequence for the peptide PS2#12
  - SEQ ID NO: 307 is the determined cDNA sequence for P711P
- 15 SEQ ID NO: 308 is the determined cDNA sequence for P712P
  - SEQ ID NO: 309 is the determined cDNA sequence for CLONE23
  - SEQ ID NO: 310 is the determined cDNA sequence for P774P
  - SEQ ID NO: 311 is the determined cDNA sequence for P775P
  - SEQ ID NO: 312 is the determined cDNA sequence for P715P
- 20 SEQ ID NO: 313 is the determined cDNA sequence for P710P
  - SEQ ID NO: 314 is the determined cDNA sequence for P767P
  - SEQ ID NO: 315 is the determined cDNA sequence for P768P
  - SEQ ID NO: 316-325 are the determined cDNA sequences of previously isolated genes
  - SEQ ID NO: 326 is the determined cDNA sequence for P703PDE5
- 25 SEQ ID NO: 327 is the predicted amino acid sequence for P703PDE5
  - SEQ ID NO: 328 is the determined cDNA sequence for P703P6.26
  - SEQ ID NO: 329 is the predicted amino acid sequence for P703P6.26
  - SEQ ID NO: 330 is the determined cDNA sequence for P703PX-23
  - SEQ ID NO: 331 is the predicted amino acid sequence for P703PX-23
- 30 SEQ ID NO: 332 is the determined full length cDNA sequence for P509S
  - SEQ ID NO: 333 is the determined extended cDNA sequence for P707P (also referred to as 11-C9)
  - SEQ ID NO: 334 is the determined cDNA sequence for P714P

SEQ ID NO: 335 is the determined cDNA sequence for P705P (also referred to as 9-F3)

SEQ ID NO: 336 is the predicted amino acid sequence for P705P

SEQ ID NO: 337 is the amino acid sequence of the peptide P1S#10

SEQ ID NO: 338 is the amino acid sequence of the peptide p5

5 SEQ ID NO: 339 is the predicted amino acid sequence of P509S

SEQ ID NO: 340 is the determined cDNA sequence for P778P

SEQ ID NO: 341 is the determined cDNA sequence for P786P

SEQ ID NO: 342 is the determined cDNA sequence for P789P

SEQ ID NO: 343 is the determined cDNA sequence for a clone showing homology to Homo

10 sapiens MM46 mRNA

SEQ ID NO: 344 is the determined cDNA sequence for a clone showing homology to Homo sapiens TNF-alpha stimulated ABC protein (ABC50) mRNA

SEQ ID NO: 345 is the determined cDNA sequence for a clone showing homology to Homo sapiens mRNA for E-cadherin

SEQ ID NO: 346 is the determined cDNA sequence for a clone showing homology to Human nuclear-encoded mitochondrial serine hydroxymethyltransferase (SHMT)

SEQ ID NO: 347 is the determined cDNA sequence for a clone showing homology to Homo sapiens natural resistance-associated macrophage protein2 (NRAMP2)

SEQ ID NO: 348 is the determined cDNA sequence for a clone showing homology to Homo sapiens phosphoglucomutase-related protein (PGMRP)

SEQ ID NO: 349 is the determined cDNA sequence for a clone showing homology to Human mRNA for proteosome subunit p40

SEQ ID NO: 350 is the determined cDNA sequence for P777P

SEQ ID NO: 351 is the determined cDNA sequence for P779P

25 SEQ ID NO: 352 is the determined cDNA sequence for P790P

SEQ ID NO: 353 is the determined cDNA sequence for P784P

SEQ ID NO: 354 is the determined cDNA sequence for P776P

SEQ ID NO: 355 is the determined cDNA sequence for P780P

SEQ ID NO: 356 is the determined cDNA sequence for P544S

30 SEQ ID NO: 357 is the determined cDNA sequence for P745S

SEQ ID NO: 358 is the determined cDNA sequence for P782P

SEQ ID NO: 359 is the determined cDNA sequence for P783P

SEQ ID NO: 360 is the determined cDNA sequence for unknown 17984

SEQ ID NO: 361 is the determined cDNA sequence for P787P

SEQ ID NO: 362 is the determined cDNA sequence for P788P

SEQ ID NO: 363 is the determined cDNA sequence for unknown 17994

5 SEQ ID NO: 364 is the determined cDNA sequence for P781P

SEQ ID NO: 365 is the determined cDNA sequence for P785P

SEQ ID NO: 366-375 are the determined cDNA sequences for splice variants of B305D.

SEQ ID NO: 376 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 366.

SEQ ID NO: 377 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 372.

SEQ ID NO: 378 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 373.

SEQ ID NO: 379 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO:

15 . 374.

SEQ ID NO: 380 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 375.

SEQ ID NO: 381 is the determined cDNA sequence for B716P.

SEQ ID NO: 382 is the determined full-length cDNA sequence for P711P.

20 SEQ ID NO: 383 is the predicted amino acid sequence for P711P.

SEQ ID NO: 384 is the cDNA sequence for P1000C.

SEQ ID NO: 385 is the cDNA sequence for CGI-82.

SEQ ID NO:386 is the cDNA sequence for 23320.

SEQ ID NO:387 is the cDNA sequence for CGI-69.

25 SEQ ID NO:388 is the cDNA sequence for L-iditol-2-dehydrogenase.

SEQ ID NO:389 is the cDNA sequence for 23379.

SEQ ID NO:390 is the cDNA sequence for 23381.

SEQ ID NO:391 is the cDNA sequence for KIAA0122.

SEQ ID NO:392 is the cDNA sequence for 23399.

30 SEQ ID NO:393 is the cDNA sequence for a previously identified gene.

SEQ ID NO:394 is the cDNA sequence for HCLBP.

SEQ ID NO:395 is the cDNA sequence for transglutaminase.

SEQ ID NO:396 is the cDNA sequence for a previously identified gene.

SEQ ID NO:397 is the cDNA sequence for PAP.

SEQ ID NO:398 is the cDNA sequence for Ets transcription factor PDEF.

SEQ ID NO:399 is the cDNA sequence for hTGR.

5 SEQ ID NO:400 is the cDNA sequence for KIAA0295.

SEQ ID NO:401 is the cDNA sequence for 22545.

SEQ ID NO:402 is the cDNA sequence for 22547.

SEQ ID NO:403 is the cDNA sequence for 22548:

SEQ ID NO:404 is the cDNA sequence for 22550.

10 SEQ ID NO:405 is the cDNA sequence for 22551.

SEQ ID NO:406 is the cDNA sequence for 22552.

SEQ ID NO:407 is the cDNA sequence for 22553.

SEQ ID NO:408 is the cDNA sequence for 22558.

SEQ ID NO:409 is the cDNA sequence for 22562.

15 SEQ ID NO:410 is the cDNA sequence for 22565.

SEQ ID NO:411 is the cDNA sequence for 22567.

SEQ ID NO:412 is the cDNA sequence for 22568.

SEQ ID NO:413 is the cDNA sequence for 22570.

SEQ ID NO:414 is the cDNA sequence for 22571.

20 SEQ ID NO:415 is the cDNA sequence for 22572.

SEQ ID NO:416 is the cDNA sequence for 22573.

SEQ ID NO:417 is the cDNA sequence for 22573.

SEQ ID NO:418 is the cDNA sequence for 22575.

SEQ ID NO:419 is the cDNA sequence for 22580.

25 SEQ ID NO:420 is the cDNA sequence for 22581.

SEQ ID NO:421 is the cDNA sequence for 22582.

SEQ ID NO:422 is the cDNA sequence for 22583.

SEQ ID NO:423 is the cDNA sequence for 22584.

SEQ ID NO:424 is the cDNA sequence for 22585.

30 SEQ ID NO:425 is the cDNA sequence for 22586.

SEQ ID NO:426 is the cDNA sequence for 22587.

SEQ ID NO:427 is the cDNA sequence for 22588.

- SEQ ID NO:428 is the cDNA sequence for 22589.
- SEQ ID NO:429 is the cDNA sequence for 22590.
- SEQ ID NO:430 is the cDNA sequence for 22591.
- SEQ ID NO:431 is the cDNA sequence for 22592.
- SEQ ID NO:432 is the cDNA sequence for 22593.
  - SEQ ID NO:433 is the cDNA sequence for 22594.
  - SEO ID NO:434 is the cDNA sequence for 22595.
  - SEQ ID NO:435 is the cDNA sequence for 22596.
  - SEQ ID NO:436 is the cDNA sequence for 22847.
- 10 SEQ ID NO:437 is the cDNA sequence for 22848.
  - SEQ ID NO:438 is the cDNA sequence for 22849.
  - SEQ ID NO:439 is the cDNA sequence for 22851.
  - SEQ ID NO:440 is the cDNA sequence for 22852.
  - SEQ ID NO:441 is the cDNA sequence for 22853.
- 15 SEQ ID NO:442 is the cDNA sequence for 22854.
  - SEQ ID NO:443 is the cDNA sequence for 22855.
  - SEQ ID NO:444 is the cDNA sequence for 22856.
  - SEQ ID NO:445 is the cDNA sequence for 22857.
  - SEQ ID NO:446 is the cDNA sequence for 23601.
- 20 SEQ ID NO:447 is the cDNA sequence for 23602.
  - SEQ ID NO:448 is the cDNA sequence for 23605.
  - SEQ ID NO:449 is the cDNA sequence for 23606.
  - SEQ ID NO:450 is the cDNA sequence for 23612.
  - SEQ ID NO:451 is the cDNA sequence for 23614.
- 25 SEQ ID NO:452 is the cDNA sequence for 23618.
  - SEO ID NO:453 is the cDNA sequence for 23622.
  - SEQ ID NO:454 is the cDNA sequence for folate hydrolase.
  - SEQ ID NO:455 is the cDNA sequence for LIM protein.
  - SEQ ID NO:456 is the cDNA sequence for a known gene.
- 30 SEQ ID NO:457 is the cDNA sequence for a known gene.
  - SEQ ID NO:458 is the cDNA sequence for a previously identified gene.
  - SEQ ID NO:459 is the cDNA sequence for 23045.

SEQ ID NO:460 is the cDNA sequence for 23032.

SEQ ID NO:461 is the cDNA sequence for 23054.

SEQ ID NO:462-467 are cDNA sequences for known genes.

SEQ ID NO:468-471 are cDNA sequences for P710P.

5 SEQ ID NO:472 is a cDNA sequence for P1001C.

SEQ ID NO: 473 is the determined cDNA sequence for a first splice variant of P775P (referred to as 27505).

SEQ ID NO: 474 is the determined cDNA sequence for a second splice variant of P775P (referred to as 19947).

SEQ ID NO: 475 is the determined cDNA sequence for a third splice variant of P775P (referred to as 19941).

SEQ ID NO: 476 is the determined cDNA sequence for a fourth splice variant of P775P (referred to as 19937).

SEQ ID NO: 477 is a first predicted amino acid sequence encoded by the sequence of SEQ ID NO:

15 474.

SEQ ID NO: 478 is a second predicted amino acid sequence encoded by the sequence of SEQ ID NO: 474.

SEQ ID NO: 479 is the predicted amino acid sequence encoded by the sequence of SEQ ID NO: 475.

SEQ ID NO: 480 is a first predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 481 is a second predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 482 is a third predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 483 is a fourth predicted amino acid sequence encoded by the sequence of SEQ ID NO: 473.

SEQ ID NO: 484 is the first 30 amino acids of the M. tuberculosis antigen Ra12.

SEQ ID NO: 485 is the PCR primer AW025.

30 SEQ ID NO: 486 is the PCR primer AW003.

SEQ ID NO: 487 is the PCR primer AW027.

SEQ ID NO: 488 is the PCR primer AW026.

SEQ ID NO: 489-501 are peptides employed in epitope mapping studies.

SEQ ID NO: 502 is the determined cDNA sequence of the complementarity determining region for the anti-P503S monoclonal antibody 20D4.

SEQ ID NO: 503 is the determined cDNA sequence of the complementarity determining region for the anti-P503S monoclonal antibody JA1.

SEQ ID NO: 504 & 505 are peptides employed in epitope mapping studies.

SEQ ID NO: 506 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 8H2.

SEQ ID NO: 507 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 7H8.

SEQ ID NO: 508 is the determined cDNA sequence of the complementarity determining region for the anti-P703P monoclonal antibody 2D4.

SEQ ID NO: 509-522 are peptides employed in epitope mapping studies.

SEQ ID NO: 523 is a mature form of P703P used to raise antibodies against P703P.SEQ ID NO:

15 524 is the putative full-length cDNA sequence of P703P.

SEQ ID NO: 525 is the predicted amino acid sequence encoded by SEQ ID NO: 524.

SEQ ID NO: 526 is the full-length cDNA sequence for P790P.

SEQ ID NO: 527 is the predicted amino acid sequence for P790P.

SEQ ID NO: 528 & 529 are PCR primers.

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20 SEQ ID NO: 530 is the cDNA sequence of a splice variant of SEQ ID NO: 366.

SEQ ID NO: 531 is the cDNA sequence of the open reading frame of SEQ ID NO: 530.

SEQ ID NO: 532 is the predicted amino acid encoded by the sequence of SEQ ID NO: 531.

SEQ ID NO: 533 is the DNA sequence of a putative ORF of P775P.

SEQ ID NO: 534 is the predicted amino acid sequence encoded by SEQ ID NO: 533.

25 SEQ ID NO: 535 is a first full-length cDNA sequence for P510S.

SEQ ID NO: 536 is a second full-length cDNA sequence for P510S.

SEQ ID NO: 537 is the predicted amino acid sequence encoded by SEQ ID NO: 535.

SEQ ID NO: 538 is the predicted amino acid sequence encoded by SEQ ID NO: 536.

SEQ ID NO: 539 is the peptide P501S-370.

30 SEQ ID NO: 540 is the peptide P501S-376.

SEQ ID NO: 541-550 are epitopes of P501S.

SEQ ID NO: 551 corresponds to amino acids 543-553 of P501S.

# DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as prostate cancer. The compositions described herein may include prostate-specific polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (e.g., T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a prostate-specific protein or a variant thereof. A "prostate-specific protein" is a protein that is expressed in normal prostate and/or prostate tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a non-prostate normal tissue, as determined using a representative assay provided herein. Certain prostate-specific proteins are proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with prostate cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human prostate-specific proteins. Sequences of polynucleotides encoding certain prostate-specific proteins, or portions thereof, are provided in SEQ ID NOs:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536. Sequences of polypeptides comprising at least a portion of a prostate-specific protein are provided in SEQ ID NOs:112-114, 172, 176, 178, 327, 329, 331, 336, 339, 376-380, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534 and 537-550.

# PROSTATE-SPECIFIC PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a prostate-specific protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred

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polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a prostate-specific protein. More preferably, a polynucleotide encodes an immunogenic portion of a prostate-specific protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (i.e., an endogenous sequence that encodes a prostate-specific protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native prostate-specific protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices

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for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenes pp. 626-645 Methods in Enzymology vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) CABIOS 5:151-153; Myers, E.W. and Muller W. (1988) CABIOS 4:11-17; Robinson, E.D. (1971) Comb. Theor 11:105; Santou, N. Nes, M. (1987) Mol. Biol. Evol. 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) Proc. Natl. Acad., Sci. USA 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e., gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e., the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native prostate-specific protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such

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as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

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Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in a prostate-specific than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA 93*:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA 94*:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as prostate-specific cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (e.g., a prostate-specific cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with <sup>32</sup>P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into

a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments; using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (see Triglia et al., Nucl. Acids Res. 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., PCR Methods Applic. 1:111-19, 1991) and walking PCR (Parker et al., Nucl. Acids. Res. 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (e.g., NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding at least a portion of a prostate-specific protein are provided in SEQ ID NO:1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536.

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Isolation of these polynucleotides is described below. Each of these prostate-specific proteins was overexpressed in prostate tumor tissue.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see Adelman et al., DNA 2:183, 1983). Alternatively, RNA molecules may be generated by in vitro or in vivo transcription of DNA sequences encoding a prostate-specific protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated in vivo (e.g., by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a prostate-specific polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (i.e., an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (see Gee et al., In Huber and Carr, Molecular and Immunologic Approaches, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (e.g., promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability in vivo. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3'

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ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl- methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (e.g., avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

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## PROSTATE-SPECIFIC POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a prostate-specific protein or a variant thereof, as described herein. As noted above, a "prostate-specific protein" is a protein that is expressed by normal prostate and/or prostate tumor cells. Proteins that are prostate-specific proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with prostate cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (i.e., specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a prostate-specific protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (e.g., 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, Fundamental Immunology, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (i.e., they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native prostate-specific protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (e.g., in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the

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immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, <sup>125</sup>I-labeled Protein A.

As noted above, a composition may comprise a variant of a native prostate-specific protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native prostate-specific protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (e.g., 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein. Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophobicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino

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acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

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Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, J. Am. Chem. Soc. 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known prostate-specific protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner),

preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., Gene 40:39-46, 1985; Murphy et al., Proc. Natl. Acad. Sci. USA 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are

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located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (see, for example, Stoute et al. New Engl. J. Med., 336:86-91, 1997).

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Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium Haemophilus influenza B (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (e.g., the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in E. coli (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemaglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from Streptococcus pneumoniae, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the LytA gene; Gene 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of E. coli C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (see Biotechnology 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its

original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

#### **BINDING AGENTS**

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The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a prostate-specific protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a prostate-specific protein if it reacts at a detectable level (within, for example, an ELISA) with a prostate-specific protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10<sup>3</sup> L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as prostate cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a prostate-specific protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (e.g., blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Most preferably, antibodies employed in the inventive methods have the ability to induce lysis of tumor cells by activation of complement and mediation of antibody-dependent cellular cytotoxicity (ADCC). Antibodies of different classes and subclasses differ in these properties. For example, mouse antibodies of the IgG2a and IgG3 classes are capable of activating serum complement upon binding to target cells which express the antigen against which the antibodies were raised, and can mediate ADCC.

Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells

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and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

The preparation of mouse and rabbit monoclonal antibodies that specifically bind to polypeptides of the present invention is described in detail below. However, the antibodies of the present invention are not limited to those derived from mice. Human antibodies may also be employed in the inventive methods and may prove to be preferable. Such antibodies can be obtained using human hybridomas as described by Cote *et al.* (Monoclonal Antibodies and Cancer Therapy, Alan R. Lisa, p. 77, 1985). The present invention also encompasses antibodies made by recombinant means such as chimeric antibodies, wherein the variable region and constant region are derived from different species, and CDR-grafted antibodies, wherein the complementarity determining region is derived from a different species, as described in US Patents 4,816,567 and 5,225,539. Chimeric antibodies may be prepared by splicing genes for a mouse antibody molecule having a desired antigen specificity together with genes for a human antibody molecule having the desired biological activity, such as activation of human complement and mediation of ADCC (Morrison *et al. Proc. Natl. Acad. Sci. USA 81*:6851, 1984; Neuberger *et al. Nature 312*:604, 1984; Takeda *et al. Nature 314*:452, 1985).

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*,

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Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include <sup>90</sup>Y, <sup>123</sup>I, <sup>125</sup>I, <sup>131</sup>I, <sup>186</sup>Re, <sup>188</sup>Re, <sup>211</sup>At, and <sup>212</sup>Bi. Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diptheria toxin, cholera toxin, gelonin, Pseudomonas exotoxin, Shigella toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (e.g., covalently bonded) to a suitable monoclonal antibody either directly or indirectly (e.g., via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (e.g., a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, e.g., U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (e.g., U.S. Patent No. 4,489,710, to

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Spitler), by irradiation of a photolabile bond (e.g., U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (e.g., U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (e.g., U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (e.g., U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (e.g., U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (e.g., U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (e.g., U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

#### T CELLS

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Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a prostate-specific protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral

blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX<sup>TM</sup> system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a prostate-specific polypeptide, polynucleotide encoding a prostate-specific polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a prostate-specific polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a prostate-specific polypeptide if the T cells specifically proliferate, secrete cytokines or kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., Cancer Res. 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (e.g., by pulselabeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a prostate-specific polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (e.g., TNF or IFN-γ) is indicative of T cell activation (see Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a prostate-specific polypeptide, polynucleotide or polypeptide-expressing APC may be CD4<sup>+</sup> and/or CD8<sup>+</sup>. Prostate-specific protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

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For therapeutic purposes, CD4<sup>+</sup> or CD8<sup>+</sup> T cells that proliferate in response to a prostate-specific polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a prostate-specific polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a prostate-specific polypeptide. Alternatively, one or more T cells that proliferate in the presence of a prostate-specific protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

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## PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (i.e., vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (e.g., polylactic galactide) and liposomes (into which the compound is incorporated; see e.g., Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression

in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as Bacillus-Calmette-Guerrin) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., Proc. Natl. Acad. Sci. USA 86:317-321, 1989; Flexner et al., Ann. N.Y. Acad. Sci. 569:86-103, 1989; Flexner et al., Vaccine 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, Biotechniques 6:616-627, 1988; Rosenfeld et al., Science 252:431-434, 1991; Kolls et al., Proc. Natl. Acad. Sci. USA 91:215-219, 1994; Kass-Eisler et al., Proc. Natl. Acad. Sci. USA 90:11498-11502, 1993; Guzman et al., Circulation 88:2838-2848, 1993; and Guzman et al., Cir. Res. 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., Science 259:1745-1749, 1993 and reviewed by Cohen, Science 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA

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or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bortadella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (e.g., IFN-γ, TNFα, IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, Ann. Rev. Immunol. 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT; see US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example,

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an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects per se and/or to be immunologically compatible with the receiver (i.e., matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature 392*:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy,

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Ann. Rev. Med. 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate in situ, with marked cytoplasmic processes (dendrites) visible in vitro), their ability to take-up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells in vivo or ex vivo, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (see Zitvogel et al., Nature Med. 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNFα to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNFα, CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcy receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (e.g., CD54 and CD11) and costimulatory molecules (e.g., CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a prostate-specific protein (or portion or other variant thereof) such that the prostate-specific polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place ex vivo, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection

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that occurs in vivo. In vivo and ex vivo transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., Immunology and cell Biology 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the prostate-specific polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (e.g., vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (e.g., a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

#### **CANCER THERAPY**

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In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as prostate cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8<sup>+</sup> cytotoxic T lymphocytes and CD4<sup>+</sup> T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer

cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth in vitro, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition in vivo are well known in the art. Such in vitro culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigenpresenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term in vivo. Studies have shown that cultured effector cells can be induced to grow in vivo and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (see, for example, Cheever et al., Immunological Reviews 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated ex vivo for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (e.g., intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (e.g., by aspiration) or orally. Preferably, between 1 and 10 doses may be administered

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over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (i.e., untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells in vitro. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (e.g., more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 µg to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (e.g., more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a prostate-specific protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

#### METHODS FOR DETECTING CANCER

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In general, a cancer may be detected in a patient based on the presence of one or more prostate-specific proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as prostate cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer.

In general, a prostate tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. See, e.g., Harlow and Lane, Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length prostate-specific proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a

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membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 µg, and preferably about 100 ng to about 1 µg, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (see, e.g., Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (i.e., incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with prostate cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by

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assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20<sup>TM</sup>. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as prostate cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., Clinical Epidemiology: A Basic Science for Clinical Medicine, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (i.e., sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (i.e., the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along

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the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1µg, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use prostate-specific polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such prostate-specific protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a prostate-specific protein in a biological sample. Within certain methods, a biological sample comprising CD4<sup>+</sup> and/or CD8<sup>+</sup> T cells isolated from a patient is incubated with a prostate-specific polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that

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expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with prostate-specific polypeptide (e.g., 5 - 25 μg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of prostate-specific polypeptide to serve as a control. For CD4<sup>+</sup> T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8<sup>+</sup> T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a prostate-specific protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a prostate-specific cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the prostate-specific protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a prostate-specific protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a prostate-specific protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382, 384-476, 524, 526, 530, 531, 533, 535 and 536. Techniques for both PCR based assays and hybridization assays

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are well known in the art (see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich ed., PCR Technology, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

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In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple prostate-specific protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for proteins provided herein may be combined with assays for other known tumor antigens.

#### DIAGNOSTIC KITS

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The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a prostate-specific protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a prostate-specific protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a prostate-specific protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a prostate-specific protein.

The following Examples are offered by way of illustration and not by way of limitation.

#### **EXAMPLES**

#### **EXAMPLE 1**

## ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES

This Example describes the isolation of certain prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library was constructed from prostate tumor poly A<sup>+</sup> RNA using a Superscript Plasmid System for cDNA Synthesis and Plasmid Cloning kit (BRL Life Technologies, Gaithersburg, MD 20897) following the manufacturer's protocol. Specifically, prostate tumor tissues were homogenized with polytron (Kinematica, Switzerland) and total RNA was extracted using Trizol reagent (BRL Life Technologies) as directed by the manufacturer. The poly A<sup>+</sup> RNA was then purified using a Qiagen oligotex spin column mRNA purification kit (Qiagen, Santa Clarita, CA 91355) according to the manufacturer's protocol. First-strand cDNA was synthesized using the Notl/Oligo-dT18 primer. Double-stranded cDNA was synthesized, ligated with EcoRI/BAXI adaptors (Invitrogen, San Diego, CA) and digested with Notl. Following size fractionation with Chroma Spin-1000 columns (Clontech, Palo Alto, CA), the cDNA was ligated into the EcoRI/Notl site of pCDNA3.1 (Invitrogen) and transformed into ElectroMax *E. coli* DH10B cells (BRL Life Technologies) by electroporation.

Using the same procedure, a normal human pancreas cDNA expression library was prepared from a pool of six tissue specimens (Clontech). The cDNA libraries were characterized by determining the number of independent colonies, the percentage of clones that carried insert, the average insert size and by sequence analysis. The prostate tumor library contained 1.64 x 10<sup>7</sup> independent colonies, with 70% of clones having an insert and the average insert size being 1745 base pairs. The normal pancreas cDNA library contained 3.3 x 10<sup>6</sup> independent colonies, with 69% of clones having inserts and the average insert size being 1120 base pairs. For both libraries, sequence analysis showed that the majority of clones had a full length cDNA sequence and were synthesized from mRNA, with minimal rRNA and mitochondrial DNA contamination.

cDNA library subtraction was performed using the above prostate tumor and normal pancreas cDNA libraries, as described by Hara et al. (Blood, 84:189-199, 1994) with some modifications. Specifically, a prostate tumor-specific subtracted cDNA library was generated as

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follows. Normal pancreas cDNA library (70  $\mu$ g) was digested with EcoRI, NotI, and SfuI, followed by a filling-in reaction with DNA polymerase Klenow fragment. After phenol-chloroform extraction and ethanol precipitation, the DNA was dissolved in 100  $\mu$ l of H<sub>2</sub>O, heat-denatured and mixed with 100  $\mu$ l (100  $\mu$ g) of Photoprobe biotin (Vector Laboratories, Burlingame, CA). As recommended by the manufacturer, the resulting mixture was irradiated with a 270 W sunlamp on ice for 20 minutes. Additional Photoprobe biotin (50  $\mu$ l) was added and the biotinylation reaction was repeated. After extraction with butanol five times, the DNA was ethanol-precipitated and dissolved in 23  $\mu$ l H<sub>2</sub>O to form the driver DNA.

To form the tracer DNA, 10 μg prostate tumor cDNA library was digested with BamHI and XhoI, phenol chloroform extracted and passed through Chroma spin-400 columns (Clontech). Following ethanol precipitation, the tracer DNA was dissolved in 5 μl H<sub>2</sub>O. Tracer DNA was mixed with 15 μl driver DNA and 20 μl of 2 x hybridization buffer (1.5 M NaCl/10 mM EDTA/50 mM HEPES pH 7.5/0.2% sodium dodecyl sulfate), overlaid with mineral oil, and heat-denatured completely. The sample was immediately transferred into a 68 °C water bath and incubated for 20 hours (long hybridization [LH]). The reaction mixture was then subjected to a streptavidin treatment followed by phenol/chloroform extraction. This process was repeated three more times. Subtracted DNA was precipitated, dissolved in 12 μl H<sub>2</sub>O, mixed with 8 μl driver DNA and 20 μl of 2 x hybridization buffer, and subjected to a hybridization at 68 °C for 2 hours (short hybridization [SH]). After removal of biotinylated double-stranded DNA, subtracted cDNA was ligated into BamHI/XhoI site of chloramphenicol resistant pBCSK+ (Stratagene, La Jolla, CA 92037) and transformed into ElectroMax *E. coli* DH10B cells by electroporation to generate a prostate tumor specific subtracted cDNA library (referred to as "prostate subtraction 1").

To analyze the subtracted cDNA library, plasmid DNA was prepared from 100 independent clones, randomly picked from the subtracted prostate tumor specific library and grouped based on insert size. Representative cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A (Foster City, CA). Six cDNA clones, hereinafter referred to as F1-13, F1-12, F1-16, H1-1, H1-9 and H1-4, were shown to be abundant in the subtracted prostate-specific cDNA library. The determined 3' and 5' cDNA sequences for F1-12 are provided in SEQ ID NO: 2 and 3, respectively, with determined 3' cDNA sequences for F1-13, F1-16, H1-1, H1-9 and H1-4 being provided in SEQ ID NO: 1 and 4-7, respectively.

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The cDNA sequences for the isolated clones were compared to known sequences in the gene bank using the EMBL and GenBank databases (release 96). Four of the prostate tumor cDNA clones, F1-13, F1-16, H1-1, and H1-4, were determined to encode the following previously identified proteins: prostate specific antigen (PSA), human glandular kallikrein, human tumor expression enhanced gene, and mitochondria cytochrome C oxidase subunit II. H1-9 was found to be identical to a previously identified human autonomously replicating sequence. No significant homologies to the cDNA sequence for F1-12 were found.

Subsequent studies led to the isolation of a full-length cDNA sequence for F1-12. This sequence is provided in SEQ ID NO: 107, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 108.

To clone less abundant prostate tumor specific genes, cDNA library subtraction was performed by subtracting the prostate tumor cDNA library described above with the normal pancreas cDNA library and with the three most abundant genes in the previously subtracted prostate tumor specific cDNA library: human glandular kallikrein, prostate specific antigen (PSA), and mitochondria cytochrome C oxidase subunit II. Specifically, 1 µg each of human glandular kallikrein, PSA and mitochondria cytochrome C oxidase subunit II cDNAs in pCDNA3.1 were added to the driver DNA and subtraction was performed as described above to provide a second subtracted cDNA library hereinafter referred to as the "subtracted prostate tumor specific cDNA library with spike".

Twenty-two cDNA clones were isolated from the subtracted prostate tumor specific cDNA library with spike. The determined 3' and 5' cDNA sequences for the clones referred to as J1-17, L1-12, N1-1862, J1-13, J1-19, J1-25, J1-24, K1-58, K1-63, L1-4 and L1-14 are provided in SEQ ID NOS: 8-9, 10-11, 12-13, 14-15, 16-17, 18-19, 20-21, 22-23, 24-25, 26-27 and 28-29, respectively. The determined 3' cDNA sequences for the clones referred to as J1-12, J1-16, J1-21, K1-48, K1-55, L1-2, L1-6, N1-1858, N1-1860, N1-1861, N1-1864 are provided in SEQ ID NOS: 30-40, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to three of the five most abundant DNA species, (J1-17, L1-12 and N1-1862; SEQ ID NOS: 8-9, 10-11 and 12-13, respectively). Of the remaining two most abundant species, one (J1-12; SEQ ID NO:30) was found to be identical to the previously identified human pulmonary surfactant-associated protein, and the other (K1-48; SEQ ID NO:33) was determined to have some homology to *R. norvegicus* mRNA for 2-arylpropionyl-CoA epimerase. Of the 17 less abundant cDNA clones isolated from the subtracted prostate tumor specific cDNA

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library with spike, four (J1-16, K1-55, L1-6 and N1-1864; SEQ ID NOS:31, 34, 36 and 40, respectively) were found to be identical to previously identified sequences, two (J1-21 and N1-1860; SEQ ID NOS: 32 and 38, respectively) were found to show some homology to non-human sequences, and two (L1-2 and N1-1861; SEQ ID NOS: 35 and 39, respectively) were found to show some homology to known human sequences. No significant homologies were found to the polypeptides J1-13, J1-19, J1-24, J1-25, K1-58, K1-63, L1-4, L1-14 (SEQ ID NOS: 14-15, 16-17, 20-21, 18-19, 22-23, 24-25, 26-27, 28-29, respectively).

Subsequent studies led to the isolation of full length cDNA sequences for J1-17, L1-12 and N1-1862 (SEQ ID NOS: 109-111, respectively). The corresponding predicted amino acid sequences are provided in SEQ ID NOS: 112-114. L1-12 is also referred to as P501S.

In a further experiment, four additional clones were identified by subtracting a prostate tumor cDNA library with normal prostate cDNA prepared from a pool of three normal prostate poly A+ RNA (referred to as "prostate subtraction 2"). The determined cDNA sequences for these clones, hereinafter referred to as U1-3064, U1-3065, V1-3692 and 1A-3905, are provided in SEQ ID NO: 69-72, respectively. Comparison of the determined sequences with those in the gene bank revealed no significant homologies to U1-3065.

A second subtraction with spike (referred to as "prostate subtraction spike 2") was performed by subtracting a prostate tumor specific cDNA library with spike with normal pancreas cDNA library and further spiked with PSA, J1-17, pulmonary surfactant-associated protein, mitochondrial DNA, cytochrome c oxidase subunit II, N1-1862, autonomously replicating sequence, L1-12 and tumor expression enhanced gene. Four additional clones, hereinafter referred to as V1-3686, R1-2330, 1B-3976 and V1-3679, were isolated. The determined cDNA sequences for these clones are provided in SEQ ID NO:73-76, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to V1-3686 and R1-2330.

Further analysis of the three prostate subtractions described above (prostate subtraction 2, subtracted prostate tumor specific cDNA library with spike, and prostate subtraction spike 2) resulted in the identification of sixteen additional clones, referred to as 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1G-4734, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4810, 1I-4811, 1J-4876, 1K-4884 and 1K-4896. The determined cDNA sequences for these clones are provided in SEQ ID NOS: 77-92, respectively. Comparison of these sequences with those in the gene bank as described above, revealed no significant homologies to 1G-4741, 1G-4734, 1I-4807, 1J-4876 and 1K-4896 (SEQ ID NOS: 79, 81, 87, 90 and 92, respectively). Further analysis of the isolated

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clones led to the determination of extended cDNA sequences for 1G-4736, 1G-4738, 1G-4741, 1G-4744, 1H-4774, 1H-4781, 1H-4785, 1H-4787, 1H-4796, 1I-4807, 1J-4876, 1K-4884 and 1K-4896, provided in SEQ ID NOS: 179-188 and 191-193, respectively, and to the determination of additional partial cDNA sequences for 1I-4810 and 1I-4811, provided in SEQ ID NOS: 189 and 190, respectively.

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Additional studies with prostate subtraction spike 2 resulted in the isolation of three more clones. Their sequences were determined as described above and compared to the most recent GenBank. All three clones were found to have homology to known genes, which are Cysteine-rich protein, KIAA0242, and KIAA0280 (SEQ ID NO: 317, 319, and 320, respectively). Further analysis of these clones by Synteni microarray (Synteni, Palo Alto, CA) demonstrated that all three clones were over-expressed in most prostate tumors and prostate BPH, as well as in the majority of normal prostate tissues tested, but low expression in all other normal tissues.

An additional subtraction was performed by subtracting a normal prostate cDNA library with normal pancreas cDNA (referred to as "prostate subtraction 3"). This led to the identification of six additional clones referred to as 1G-4761, 1G-4762, 1H-4766, 1H-4770, 1H-4771 and 1H-4772 (SEQ ID NOS: 93-98). Comparison of these sequences with those in the gene bank revealed no significant homologies to 1G-4761 and 1H-4771 (SEQ ID NOS: 93 and 97, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1G-4761, 1G-4762, 1H-4766 and 1H-4772 provided in SEQ ID NOS: 194-196 and 199, respectively, and to the determination of additional partial cDNA sequences for 1H-4770 and 1H-4771, provided in SEQ ID NOS: 197 and 198, respectively.

Subtraction of a prostate tumor cDNA library, prepared from a pool of polyA+ RNA from three prostate cancer patients, with a normal pancreas cDNA library (prostate subtraction 4) led to the identification of eight clones, referred to as 1D-4297, 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280 (SEQ ID NOS: 99-107). These sequences were compared to those in the gene bank as described above. No significant homologies were found to 1D-4283 and 1D-4304 (SEQ ID NOS: 103 and 104, respectively). Further analysis of the isolated clones led to the determination of extended cDNA sequences for 1D-4309, 1D.1-4278, 1D-4288, 1D-4283, 1D-4304, 1D-4296 and 1D-4280, provided in SEQ ID NOS: 200-206, respectively.

cDNA clones isolated in prostate subtraction 1 and prostate subtraction 2, described above, were colony PCR amplified and their mRNA expression levels in prostate tumor, normal prostate and in various other normal tissues were determined using microarray technology (Synteni,

Palo Alto, CA). Briefly, the PCR amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. This intensity correlates with the hybridization intensity. Two clones (referred to as P509S and P510S) were found to be over-expressed in prostate tumor and normal prostate and expressed at low levels in all other normal tissues tested (liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon). The determined cDNA sequences for P509S and P510S are provided in SEQ ID NO: 223 and 224, respectively. Comparison of these sequences with those in the gene bank as described above, revealed some homology to previously identified ESTs.

Additional, studies led to the isolation of the full-length cDNA sequence for P509S. This sequence is provided in SEQ ID NO: 332, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 339. Two variant full-length cDNA sequences for P510S are provided in SEQ ID NO: 535 and 536, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 537 and 538, respectively.

#### **EXAMPLE 2**

### DETERMINATION OF TISSUE SPECIFICITY OF PROSTATE-SPECIFIC POLYPEPTIDES

Using gene specific primers, mRNA expression levels for the representative prostate-specific polypeptides F1-16, H1-1, J1-17 (also referred to as P502S), L1-12 (also referred to as P501S), F1-12 (also referred to as P504S) and N1-1862 (also referred to as P503S) were examined in a variety of normal and tumor tissues using RT-PCR.

Briefly, total RNA was extracted from a variety of normal and tumor tissues using Trizol reagent as described above. First strand synthesis was carried out using 1-2  $\mu$ g of total RNA with SuperScript II reverse transcriptase (BRL Life Technologies) at 42  $^{\circ}$ C for one hour. The cDNA was then amplified by PCR with gene-specific primers. To ensure the semi-quantitative nature of the RT-PCR,  $\beta$ -actin was used as an internal control for each of the tissues examined. First, serial dilutions of the first strand cDNAs were prepared and RT-PCR assays were performed using  $\beta$ -actin specific primers. A dilution was then chosen that enabled the linear range amplification of the  $\beta$ -actin template and which was sensitive enough to reflect the differences in the initial copy numbers. Using these conditions, the  $\beta$ -actin levels were determined for each

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reverse transcription reaction from each tissue. DNA contamination was minimized by DNase treatment and by assuring a negative PCR result when using first strand cDNA that was prepared without adding reverse transcriptase.

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mRNA Expression levels were examined in four different types of tumor tissue (prostate tumor from 2 patients, breast tumor from 3 patients, colon tumor, lung tumor), and sixteen different normal tissues, including prostate, colon, kidney, liver, lung, ovary, pancreas, skeletal muscle, skin, stomach, testes, bone marrow and brain. F1-16 was found to be expressed at high levels in prostate tumor tissue, colon tumor and normal prostate, and at lower levels in normal liver, skin and testes, with expression being undetectable in the other tissues examined. H1-1 was found to be expressed at high levels in prostate tumor, lung tumor, breast tumor, normal prostate, normal colon and normal brain, at much lower levels in normal lung, pancreas, skeletal muscle, skin, small intestine, bone marrow, and was not detected in the other tissues tested. J1-17 (P502S) and L1-12 (P501S) appear to be specifically over-expressed in prostate, with both genes being expressed at high levels in prostate tumor and normal prostate but at low to undetectable levels in all the other tissues examined. N1-1862 (P503S) was found to be over-expressed in 60% of prostate tumors and detectable in normal colon and kidney. The RT-PCR results thus indicate that F1-16, H1-1, J1-17 (P502S), N1-1862 (P503S) and L1-12 (P501S) are either prostate specific or are expressed at significantly elevated levels in prostate.

Further RT-PCR studies showed that F1-12 (P504S) is over-expressed in 60% of prostate tumors, detectable in normal kidney but not detectable in all other tissues tested. Similarly, R1-2330 was shown to be over-expressed in 40% of prostate tumors, detectable in normal kidney and liver, but not detectable in all other tissues tested. U1-3064 was found to be over-expressed in 60% of prostate tumors, and also expressed in breast and colon tumors, but was not detectable in normal tissues.

RT-PCR characterization of R1-2330, U1-3064 and 1D-4279 showed that these three antigens are over-expressed in prostate and/or prostate tumors.

Northern analysis with four prostate tumors, two normal prostate samples, two BPH prostates, and normal colon, kidney, liver, lung, pancrease, skeletal muscle, brain, stomach, testes, small intestine and bone marrow, showed that L1-12 (P501S) is over-expressed in prostate tumors and normal prostate, while being undetectable in other normal tissues tested. J1-17 (P502S) was detected in two prostate tumors and not in the other tissues tested. N1-1862 (P503S) was found to be over-expressed in three prostate tumors and to be expressed in normal prostate, colon and kidney,

but not in other tissues tested. F1-12 (P504S) was found to be highly expressed in two prostate tumors and to be undetectable in all other tissues tested.

The microarray technology described above was used to determine the expression levels of representative antigens described herein in prostate tumor, breast tumor and the following normal tissues: prostate, liver, pancreas, skin, bone marrow, brain, breast, adrenal gland, bladder, testes, salivary gland, large intestine, kidney, ovary, lung, spinal cord, skeletal muscle and colon. L1-12 (P501S) was found to be over-expressed in normal prostate and prostate tumor, with some expression being detected in normal skeletal muscle. Both J1-12 and F1-12 (P504S) were found to be over-expressed in prostate tumor, with expression being lower or undetectable in all other tissues tested. N1-1862 (P503S) was found to be expressed at high levels in prostate tumor and normal prostate, and at low levels in normal large intestine and normal colon, with expression being undetectable in all other tissues tested. R1-2330 was found to be over-expressed in prostate tumor and normal prostate, and to be expressed at lower levels in all other tissues tested. 1D-4279 was found to be over-expressed in prostate tumor and normal prostate, expressed at lower levels in normal spinal cord, and to be undetectable in all other tissues tested.

Further microarray analysis to specifically address the extent to which P501S (SEQ ID NO: 110) was expressed in breast tumor revealed moderate over-expression not only in breast tumor, but also in metastatic breast tumor (2/31), with negligible to low expression in normal tissues. This data suggests that P501S may be over-expressed in various breast tumors as well as in prostate tumors.

The expression levels of 32 ESTs (expressed sequence tags) described by Vasmatzis et al. (Proc. Natl. Acad. Sci. USA 95:300-304, 1998) in a variety of tumor and normal tissues were examined by microarray technology as described above. Two of these clones (referred to as P1000C and P1001C) were found to be over-expressed in prostate tumor and normal prostate, and expressed at low to undetectable levels in all other tissues tested (normal aorta, thymus, resting and activated PBMC, epithelial cells, spinal cord, adrenal gland, fetal tissues, skin, salivary gland, large intestine, bone marrow, liver, lung, dendritic cells, stomach, lymph nodes, brain, heart, small intestine, skeletal muscle, colon and kidney. The determined cDNA sequences for P1000C and P1001C are provided in SEQ ID NO: 384 and 472, respectively. The sequence of P1001C was found to show some homology to the previously isolated Human mRNA for JM27 protein. No significant homologies were found to the sequence of P1000C.

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The expression of the polypeptide encoded by the full length cDNA sequence for F1-12 (also referred to as P504S; SEQ ID NO: 108) was investigated by immunohistochemical analysis. Rabbit-anti-P504S polyclonal antibodies were generated against the full length P504S protein by standard techniques. Subsequent isolation and characterization of the polyclonal antibodies were also performed by techniques well known in the art. Immunohistochemical analysis showed that the P504S polypeptide was expressed in 100% of prostate carcinoma samples tested (n=5).

The rabbit-anti-P504S polyclonal antibody did not appear to label benign prostate cells with the same cytoplasmic granular staining, but rather with light nuclear staining. Analysis of normal tissues revealed that the encoded polypeptide was found to be expressed in some, but not all normal human tissues. Positive cytoplasmic staining with rabbit-anti-P504S polyclonal antibody was found in normal human kidney, liver, brain, colon and lung-associated macrophages, whereas heart and bone marrow were negative.

This data indicates that the P504S polypeptide is present in prostate cancer tissues, and that there are qualitative and quantitative differences in the staining between benign prostatic hyperplasia tissues and prostate cancer tissues, suggesting that this polypeptide may be detected selectively in prostate tumors and therefore be useful in the diagnosis of prostate cancer.

20 EXAMPLE 3

# ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES BY PCR-BASED SUBTRACTION

A cDNA subtraction library, containing cDNA from normal prostate subtracted with ten other normal tissue cDNAs (brain, heart, kidney, liver, lung, ovary, placenta, skeletal muscle, spleen and thymus) and then submitted to a first round of PCR amplification, was purchased from Clontech. This library was subjected to a second round of PCR amplification, following the manufacturer's protocol. The resulting cDNA fragments were subcloned into the vector pT7 Blue T-vector (Novagen, Madison, WI) and transformed into XL-1 Blue MRF' *E. coli* (Stratagene). DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A.

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Fifty-nine positive clones were sequenced. Comparison of the DNA sequences of these clones with those in the gene bank, as described above, revealed no significant homologies to 25 of these clones, hereinafter referred to as P5, P8, P9, P18, P20, P30, P34, P36, P38, P39, P42, P49, P50, P53, P55, P60, P64, P65, P73, P75, P76, P79 and P84. The determined cDNA sequences for these clones are provided in SEQ ID NO: 41-45, 47-52 and 54-65, respectively. P29, P47, P68, P80 and P82 (SEQ ID NO: 46, 53 and 66-68, respectively) were found to show some degree of homology to previously identified DNA sequences. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in prostate.

Further studies using the PCR-based methodology described above resulted in the isolation of more than 180 additional clones, of which 23 clones were found to show no significant homologies to known sequences. The determined cDNA sequences for these clones are provided in SEQ ID NO: 115-123, 127, 131, 137, 145, 147-151, 153, 156-158 and 160. Twenty-three clones (SEQ ID NO: 124-126, 128-130, 132-136, 138-144, 146, 152, 154, 155 and 159) were found to show some homology to previously identified ESTs. An additional ten clones (SEQ ID NO: 161-170) were found to have some degree of homology to known genes. Larger cDNA clones containing the P20 sequence represent splice variants of a gene referred to as P703P. The determined DNA sequence for the variants referred to as DE1, DE13 and DE14 are provided in SEQ ID NOS: 171, 175 and 177, respectively, with the corresponding predicted amino acid sequences being provided in SEQ ID NO: 172, 176 and 178, respectively. The determined cDNA sequence for an extended spliced form of P703 is provided in SEQ ID NO: 225. The DNA sequences for the splice variants referred to as DE2 and DE6 are provided in SEQ ID NOS: 173 and 174, respectively.

mRNA Expression levels for representative clones in tumor tissues (prostate (n=5), breast (n=2), colon and lung) normal tissues (prostate (n=5), colon, kidney, liver, lung (n=2), ovary (n=2), skeletal muscle, skin, stomach, small intestine and brain), and activated and non-activated PBMC was determined by RT-PCR as described above. Expression was examined in one sample of each tissue type unless otherwise indicated.

P9 was found to be highly expressed in normal prostate and prostate tumor compared to all normal tissues tested except for normal colon which showed comparable expression. P20, a portion of the P703P gene, was found to be highly expressed in normal prostate and prostate tumor, compared to all twelve normal tissues tested. A modest increase in expression of P20 in breast tumor (n=2), colon tumor and lung tumor was seen compared to all normal tissues except lung (1 of

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2). Increased expression of P18 was found in normal prostate, prostate tumor and breast tumor compared to other normal tissues except lung and stomach. A modest increase in expression of P5 was observed in normal prostate compared to most other normal tissues. However, some elevated expression was seen in normal lung and PBMC. Elevated expression of P5 was also observed in prostate tumors (2 of 5), breast tumor and one lung tumor sample. For P30, similar expression levels were seen in normal prostate and prostate tumor, compared to six of twelve other normal tissues tested. Increased expression was seen in breast tumors, one lung tumor sample and one colon tumor sample, and also in normal PBMC. P29 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to the majority of normal tissues. However, substantial expression of P29 was observed in normal colon and normal lung (2 of 2). P80 was found to be over-expressed in prostate tumor (5 of 5) and normal prostate (5 of 5) compared to all other normal tissues tested, with increased expression also being seen in colon tumor.

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Further studies resulted in the isolation of twelve additional clones, hereinafter referred to as 10-d8, 10-h10, 11-c8, 7-g6, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3, 8-h11, 9-f12 and 9-f3. The determined DNA sequences for 10-d8, 10-h10, 11-c8, 8-d4, 8-d9, 8-h11, 9-f12 and 9-f3 are provided in SEQ ID NO: 207, 208, 209, 216, 217, 220, 221 and 222, respectively. The determined forward and reverse DNA sequences for 7-g6, 8-b5, 8-b6 and 8-g3 are provided in SEQ ID NO: 210 and 211; 212 and 213; 214 and 215; and 218 and 219, respectively. Comparison of these sequences with those in the gene bank revealed no significant homologies to the sequence of 9-f3. The clones 10-d8, 11-c8 and 8-h11 were found to show some homology to previously isolated ESTs, while 10-h10, 8-b5, 8-b6, 8-d4, 8-d9, 8-g3 and 9-f12 were found to show some homology to previously identified genes. Further characterization of 7-G6 and 8-G3 showed identity to the known genes PAP and PSA, respectively.

mRNA expression levels for these clones were determined using the micro-array technology described above. The clones 7-G6, 8-G3, 8-B5, 8-B6, 8-D4, 8-D9, 9-F3, 9-F12, 9-H3, 10-A2, 10-A4, 11-C9 and 11-F2 were found to be over-expressed in prostate tumor and normal prostate, with expression in other tissues tested being low or undetectable. Increased expression of 8-F11 was seen in prostate tumor and normal prostate, bladder, skeletal muscle and colon. Increased expression of 10-H10 was seen in prostate tumor and normal prostate, bladder, lung, colon, brain and large intestine. Increased expression of 9-B1 was seen in prostate tumor, breast tumor, and normal prostate, salivary gland, large intestine and skin, with increased expression of 11-C8 being seen in prostate tumor, and normal prostate and large intestine.

An additional cDNA fragment derived from the PCR-based normal prostate subtraction, described above, was found to be prostate specific by both micro-array technology and RT-PCR. The determined cDNA sequence of this clone (referred to as 9-A11) is provided in SEQ ID NO: 226. Comparison of this sequence with those in the public databases revealed 99% identity to the known gene HOXB13.

Further studies led to the isolation of the clones 8-C6 and 8-H7. The determined cDNA sequences for these clones are provided in SEQ ID NO: 227 and 228, respectively. These sequences were found to show some homology to previously isolated ESTs.

PCR and hybridization-based methodologies were employed to obtain longer cDNA sequences for clone P20 (also referred to as P703P), yielding three additional cDNA fragments that progressively extend the 5' end of the gene. These fragments, referred to as P703PDE5, P703P6.26, and P703PX-23 (SEQ ID NO: 326, 328 and 330, with the predicted corresponding amino acid sequences being provided in SEQ ID NO: 327, 329 and 331, respectively) contain additional 5' sequence. P703PDE5 was recovered by screening of a cDNA library (#141-26) with a portion of P703P as a probe. P703P6.26 was recovered from a mixture of three prostate tumor cDNAs and P703PX\_23 was recovered from cDNA library (#438-48). Together, the additional sequences include all of the putative mature serine protease along with part of the putative signal sequence. The putative full-length cDNA sequence for P703P is provided in SEQ ID NO: 524, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 525.

Further studies using a PCR-based subtraction library of a prostate tumor pool subtracted against a pool of normal tissues (referred to as JP: PCR subtraction) resulted in the isolation of thirteen additional clones, seven of which did not share any significant homology to known GenBank sequences. The determined cDNA sequences for these seven clones (P711P, P712P, novel 23, P774P, P775P, P710P and P768P) are provided in SEQ ID NO: 307-311, 313 and 315, respectively. The remaining six clones (SEQ ID NO: 316 and 321-325) were shown to share some homology to known genes. By microarray analysis, all thirteen clones showed three or more fold over-expression in prostate tissues, including prostate tumors, BPH and normal prostate as compared to normal non-prostate tissues. Clones P711P, P712P, novel 23 and P768P showed over-expression in most prostate tumors and BPH tissues tested (n=29), and in the majority of normal prostate tissues (n=4), but background to low expression levels in all normal tissues. Clones P774P, P775P and P710P showed comparatively lower expression and expression in fewer prostate tumors and BPH samples, with negative to low expression in normal prostate.

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The full-length cDNA for P711P was obtained by employing the partial sequence of SEQ ID NO: 307 to screen a prostate cDNA library. Specifically, a directionally cloned prostate cDNA library was prepared using standard techniques. One million colonies of this library were plated onto LB/Amp plates. Nylon membrane filters were used to lift these colonies, and the cDNAs which were picked up by these filters were denatured and cross-linked to the filters by UV light. The P711P cDNA fragment of SEQ ID NO: 307 was radio-labeled and used to hybridize with these filters. Positive clones were selected, and cDNAs were prepared and sequenced using an automatic Perkin Elmer/Applied Biosystems sequencer. The determined full-length sequence of P711P is provided in SEQ ID NO: 382, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 383.

Using PCR and hybridization-based methodologies, additional cDNA sequence information was derived for two clones described above, 11-C9 and 9-F3, herein after referred to as P707P and P714P, respectively (SEQ ID NO: 333 and 334). After comparison with the most recent GenBank, P707P was found to be a splice variant of the known gene HoxB13. In contrast, no significant homologies to P714P were found.

Clones 8-B3, P89, P98, P130 and P201 (as disclosed in U.S. Patent Application No. 09/020,956, filed February 9, 1998) were found to be contained within one contiguous sequence, referred to as P705P (SEQ ID NO: 335, with the predicted amino acid sequence provided in SEQ ID NO: 336), which was determined to be a splice variant of the known gene NKX 3.1.

Further studies on P775P resulted in the isolation of four additional sequences (SEQ ID NO: 473-476) which are all splice variants of the P775P gene. The sequence of SEQ ID NO: 474 was found to contain two open reading frames (ORFs). The predicted amino acid sequences encoded by these ORFs are provided in SEQ ID NO: 477 and 478. The cDNA sequence of SEQ ID NO: 475 was found to contain an ORF which encodes the amino acid sequence of SEQ ID NO: 479. The cDNA sequence of SEQ ID NO: 473 was found to contain four ORFs. The predicted amino acid sequences encoded by these ORFs are provided in SEQ ID NO: 480-483.

Subsequent studies led to the identification of a genomic region on chromosome 22q11.2, known as the Cat Eye Syndrome region, that contains the five prostate genes P704P, P712P, P774P, P775P and B305D. The relative location of each of these five genes within the genomic region is shown in Fig. 10. This region may therefore be associated with malignant tumors, and other potential tumor genes may be contained within this region. These studies also led

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to the identification of a potential open reading frame (ORF) for P775P (provided in SEQ ID NO: 533), which encodes the amino acid sequence of SEQ ID NO: 534.

# EXAMPLE 4 SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems 430A using FMOC chemistry with HPTU (O-Benzotriazole-N,N,N',N'synthesizer tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

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# EXAMPLE 5 FURTHER ISOLATION AND CHARACTERIZATION OF PROSTATE-SPECIFIC POLYPEPTIDES BY PCR-BASED SUBTRACTION

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A cDNA library generated from prostate primary tumor mRNA as described above was subtracted with cDNA from normal prostate. The subtraction was performed using a PCR-based protocol (Clontech), which was modified to generate larger fragments. Within this protocol, tester and driver double stranded cDNA were separately digested with five restriction enzymes that recognize six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in an average cDNA size of 600 bp, rather than the average size of 300 bp that results from digestion with Rsal according to the Clontech protocol. This modification did not affect the

subtraction efficiency. Two tester populations were then created with different adapters, and the driver library remained without adapters.

The tester and driver libraries were then hybridized using excess driver cDNA. In the first hybridization step, driver was separately hybridized with each of the two tester cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs and (d) unhybridized driver cDNAs. The two separate hybridization reactions were then combined, and rehybridized in the presence of additional denatured driver cDNA. Following this second hybridization, in addition to populations (a) through (d), a fifth population (e) was generated in which tester cDNA with one adapter hybridized to tester cDNA with the second adapter. Accordingly, the second hybridization step resulted in enrichment of differentially expressed sequences which could be used as templates for PCR amplification with adaptor-specific primers.

The ends were then filled in, and PCR amplification was performed using adaptorspecific primers. Only population (e), which contained tester cDNA that did not hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are overexpressed in prostate tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

In addition to genes known to be overexpressed in prostate tumor, seventy-seven further clones were identified. Sequences of these partial cDNAs are provided in SEQ ID NO: 29 to 305. Most of these clones had no significant homology to database sequences. Exceptions were JPTPN23 (SEQ ID NO: 231; similarity to pig valosin-containing protein), JPTPN30 (SEQ ID NO: 234; similarity to rat mRNA for proteasome subunit), JPTPN45 (SEQ ID NO: 243; similarity to rat norvegicus cytosolic NADP-dependent isocitrate dehydrogenase), JPTPN46 (SEQ ID NO: 244; similarity to human subclone H8 4 d4 DNA sequence), JP1D6 (SEQ ID NO: 265; similarity to G gallus dynein light chain-A), JP8D6 (SEQ ID NO: 288; similarity to human BAC clone RG016J04), JP8F5 (SEQ ID NO: 289; similarity to human subclone H8 3 b5 DNA sequence), and JP8E9 (SEQ ID NO: 299; similarity to human Alu sequence).

Additional studies using the PCR-based subtraction library consisting of a prostate tumor pool subtracted against a normal prostate pool (referred to as PT-PN PCR subtraction) yielded three additional clones. Comparison of the cDNA sequences of these clones with the most

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recent release of GenBank revealed no significant homologies to the two clones referred to as P715P and P767P (SEQ ID NO: 312 and 314). The remaining clone was found to show some homology to the known gene KIAA0056 (SEQ ID NO: 318). Using microarray analysis to measure mRNA expression levels in various tissues, all three clones were found to be over-expressed in prostate tumors and BPH tissues. Specifically, clone P715P was over-expressed in most prostate tumors and BPH tissues by a factor of three or greater, with elevated expression seen in the majority of normal prostate samples and in fetal tissue, but negative to low expression in all other normal tissues. Clone P767P was over-expressed in several prostate tumors and BPH tissues, with moderate expression levels in half of the normal prostate samples, and background to low expression in all other normal tissues tested.

Further analysis, by microarray as described above, of the PT-PN PCR subtraction library and of a DNA subtraction library containing cDNA from prostate tumor subtracted with a pool of normal tissue cDNAs, led to the isolation of 27 additional clones (SEQ ID NO: 340-365 and 381) which were determined to be over-expressed in prostate tumor. The clones of SEQ ID NO: 341, 342, 345, 347, 348, 349, 351, 355-359, 361, 362 and 364 were also found to be expressed in normal prostate. Expression of all 26 clones in a variety of normal tissues was found to be low or undetectable, with the exception of P544S (SEQ ID NO: 356) which was found to be expressed in small intestine. Of the 26 clones, 10 (SEQ ID NO: 340-349) were found to show some homology to previously identified sequences. No significant homologies were found to the clones of SEQ ID NO: 350, 351 and 353-365.

Further studies on the clone of SEQ ID NO: 352 (referred to as P790P) led to the isolation of the full-length cDNA sequence of SEQ ID NO: 526. The corresponding predicted amino acid is provided in SEQ ID NO: 527. Data from two quantitative PCR experiments indicated that P790P is over-expressed in 11/15 tested prostate tumor samples and is expressed at low levels in spinal cord, with no expression being seen in all other normal samples tested. Data from further PCR experiments and microarray experiments showed over-expression in normal prostate and prostate tumor with little or no expression in other tissues tested. P790P was subsequently found to show significant homology to a previously identified G-protein coupled prostate tissue receptor.

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### **EXAMPLE 6**

## PEPTIDE PRIMING OF MICE AND PROPAGATION OF CTL LINES

6.1. This Example illustrates the preparation of a CTL cell line specific for cells expressing the P502S gene.

Mice expressing the transgene for human HLA A2Kb (provided by Dr L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with P2S#12 peptide (VLGWVAEL: SEQ ID NO: 306), which is derived from the P502S gene (also referred to herein as J1-17, SEQ ID NO: 8), as described by Theobald et al., Proc. Natl. Acad. Sci. USA 92:11993-11997, 1995 with the following modifications. Mice were immunized with 100µg of P2S#12 and 120µg of an I-Ab binding peptide derived from hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and using a nylon mesh single cell suspensions prepared. Cells were then resuspended at 6 x 106 cells/ml in complete media (RPMI-1640; Gibco BRL, Gaithersburg, MD) containing 10% FCS, 2mM Glutamine (Gibco BRL), sodium pyruvate (Gibco BRL), non-essential amino acids (Gibco BRL), 2 x 10<sup>-5</sup> M 2-mercaptoethanol, 50U/ml penicillin and streptomycin, and cultured in the presence of irradiated (3000 rads) P2S#12-pulsed (5mg/ml P2S#12 and 10mg/ml β2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7µg/ml dextran sulfate and 25µg/ml LPS for 3 days). Six days later, cells (5 x 10<sup>5</sup>/ml) were restimulated with 2.5 x 10<sup>6</sup>/ml peptide pulsed irradiated (20,000 rads) EL4A2Kb cells (Sherman et al, Science 258:815-818, 1992) and 3 x 106/ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20U/ml IL-2. Cells continued to be restimulated on a weekly basis as described, in preparation for cloning the line.

P2S#12 line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1 x 10<sup>4</sup> cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5 x 10<sup>5</sup> cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were restimulated as before. On day 21, clones that were growing were isolated and maintained in culture. Several of these clones demonstrated significantly higher reactivity (lysis) against human fibroblasts (HLA A2Kb expressing) transduced with P502S than against control fibroblasts. An example is presented in Figure 1.

This data indicates that P2S #12 represents a naturally processed epitope of the P502S protein that is expressed in the context of the human HLA A2Kb molecule.

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6.2. This Example illustrates the preparation of murine CTL lines and CTL clones specific for cells expressing the P501S gene.

This series of experiments were performed similarly to that described above. Mice were immunized with the P1S#10 peptide (SEQ ID NO: 337), which is derived from the P501S gene (also referred to herein as L1-12, SEQ ID NO: 110). The P1S#10 peptide was derived by analysis of the predicted polypeptide sequence for P501S for potential HLA-A2 binding sequences as defined by published HLA-A2 binding motifs (Parker, KC, et al, J. Immunol., 152:163, 1994). P1S#10 peptide was synthesized as described in Example 4, and empirically tested for HLA-A2 binding using a T cell based competition assay. Predicted A2 binding peptides were tested for their ability to compete HLA-A2 specific peptide presentation to an HLA-A2 restricted CTL clone (D150M58), which is specific for the HLA-A2 binding influenza matrix peptide fluM58. D150M58 CTL secretes TNF in response to self-presentation of peptide fluM58. In the competition assay, test peptides at 100-200 µg/ml were added to cultures of D150M58 CTL in order to bind HLA-A2 on the CTL. After thirty minutes, CTL cultured with test peptides, or control peptides, were tested for their antigen dose response to the fluM58 peptide in a standard TNF bioassay. As shown in Figure 3, peptide P1S#10 competes HLA-A2 restricted presentation of fluM58, demonstrating that peptide P1S#10 binds HLA-A2.

Mice expressing the transgene for human HLA A2Kb were immunized as described by Theobald et al. (*Proc. Natl. Acad. Sci. USA 92*:11993-11997, 1995) with the following modifications. Mice were immunized with 62.5μg of P1S #10 and 120μg of an I-A<sup>b</sup> binding peptide derived from Hepatitis B Virus protein emulsified in incomplete Freund's adjuvant. Three weeks later these mice were sacrificed and single cell suspensions prepared using a nylon mesh. Cells were then resuspended at 6 x 10<sup>6</sup> cells/ml in complete media (as described above) and cultured in the presence of irradiated (3000 rads) P1S#10-pulsed (2μg/ml P1S#10 and 10mg/ml β2-microglobulin) LPS blasts (A2 transgenic spleens cells cultured in the presence of 7μg/ml dextran sulfate and 25μg/ml LPS for 3 days). Six days later cells (5 x 10<sup>5</sup>/ml) were restimulated with 2.5 x 10<sup>6</sup>/ml peptide-pulsed irradiated (20,000 rads) EL4A2Kb cells, as described above, and 3 x 10<sup>6</sup>/ml A2 transgenic spleen feeder cells. Cells were cultured in the presence of 20 U/ml IL-2. Cells were restimulated on a weekly basis in preparation for cloning. After three rounds of *in vitro* stimulations, one line was generated that recognized P1S#10-pulsed Jurkat A2Kb targets and P501S-transduced Jurkat targets as shown in Figure 4.

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A P1S#10-specific CTL line was cloned by limiting dilution analysis with peptide pulsed EL4 A2Kb tumor cells (1 x 10<sup>4</sup> cells/ well) as stimulators and A2 transgenic spleen cells as feeders (5 x 10<sup>5</sup> cells/ well) grown in the presence of 30U/ml IL-2. On day 14, cells were restimulated as before. On day 21, viable clones were isolated and maintained in culture. As shown in Figure 5, five of these clones demonstrated specific cytolytic reactivity against P501S-transduced Jurkat A2Kb targets. This data indicates that P1S#10 represents a naturally processed epitope of the P501S protein that is expressed in the context of the human HLA-A2.1 molecule.

### **EXAMPLE 7**

# PRIMING OF CTL *IN VIVO* USING NAKED DNA IMMUNIZATION WITH A PROSTATE ANTIGEN

The prostate-specific antigen L1-12, as described above, is also referred to as P501S. HLA A2Kb Tg mice (provided by Dr L. Sherman, The Scripps Research Institute, La Jolla, CA) were immunized with 100 µg P501S in the vector VR1012 either intramuscularly or intradermally. The mice were immunized three times, with a two week interval between immunizations. Two weeks after the last immunization, immune spleen cells were cultured with Jurkat A2Kb-P501S transduced stimulator cells. CTL lines were stimulated weekly. After two weeks of *in vitro* stimulation, CTL activity was assessed against P501S transduced targets. Two out of 8 mice developed strong anti-P501S CTL responses. These results demonstrate that P501S contains at least one naturally processed HLA-A2-restricted CTL epitope.

### **EXAMPLE 8**

# ABILITY OF HUMAN T CELLS TO RECOGNIZE PROSTATE-SPECIFIC POLYPEPTIDES

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This Example illustrates the ability of T cells specific for a prostate tumor polypeptide to recognize human tumor.

Human CD8<sup>+</sup> T cells were primed *in vitro* to the P2S-12 peptide (SEQ ID NO: 306) derived from P502S (also referred to as J1-17) using dendritic cells according to the protocol of Van Tsai et al. (*Critical Reviews in Immunology 18*:65-75, 1998). The resulting CD8<sup>+</sup> T cell microcultures were tested for their ability to recognize the P2S-12 peptide presented by autologous fibroblasts or fibroblasts which were transduced to express the P502S gene in a γ-interferon

ELISPOT assay (see Lalvani et al., J. Exp. Med. 186:859-865, 1997). Briefly, titrating numbers of T cells were assayed in duplicate on 10<sup>4</sup> fibroblasts in the presence of 3 μg/ml human β<sub>2</sub>microglobulin and 1 µg/ml P2S-12 peptide or control E75 peptide. In addition, T cells were simultaneously assayed on autologous fibroblasts transduced with the P502S gene or as a control. fibroblasts transduced with HER-2/neu. Prior to the assay, the fibroblasts were treated with 10 ng/ml γ-interferon for 48 hours to upregulate class I MHC expression. One of the microcultures (#5) demonstrated strong recognition of both peptide pulsed fibroblasts as well as transduced fibroblasts in a γ-interferon ELISPOT assay. Figure 2A demonstrates that there was a strong increase in the number of y-interferon spots with increasing numbers of T cells on fibroblasts pulsed with the P2S-12 peptide (solid bars) but not with the control E75 peptide (open bars). This shows the ability of these T cells to specifically recognize the P2S-12 peptide. As shown in Figure 2B, this microculture also demonstrated an increase in the number of y-interferon spots with increasing numbers of T cells on fibroblasts transduced to express the P502S gene but not the HER-2/neu gene. These results provide additional confirmatory evidence that the P2S-12 peptide is a naturally processed epitope of the P502S protein. Furthermore, this also demonstrates that there exists in the human T cell repertoire, high affinity T cells which are capable of recognizing this epitope. These T cells should also be capable of recognizing human tumors which express the P502S gene.

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### EXAMPLE 9

# ELICITATION OF PROSTATE ANTIGEN-SPECIFIC CTL RESPONSES IN HUMAN BLOOD

This Example illustrates the ability of a prostate-specific antigen to elicit a CTL response in blood of normal humans.

Autologous dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal donors by growth for five days in RPMI medium containing 10% human serum, 50 ng/ml GMCSF and 30 ng/ml IL-4. Following culture, DC were infected overnight with recombinant P501S-expressing vaccinia virus at an M.O.I. of 5 and matured for 8 hours by the addition of 2 micrograms/ml CD40 ligand. Virus was inactivated by UV irradiation, CD8<sup>+</sup> cells were isolated by positive selection using magnetic beads, and priming cultures were initiated in 24-well plates. Following five stimulation cycles using autologous fibroblasts retrovirally transduced

to express P501S and CD80, CD8+ lines were identified that specifically produced interferongamma when stimulated with autologous P501S-transduced fibroblasts. The P501S-specific activity of cell line 3A-1 could be maintained following additional stimulation cycles on autologous B-LCL transduced with P501S. Line 3A-1 was shown to specifically recognize autologous B-LCL transduced to express P501S, but not EGFP-transduced autologous B-LCL, as measured by cytotoxicity assays (<sup>51</sup>Cr release) and interferon-gamma production (Interferon-gamma Elispot; *see* above and Lalvani et al., *J. Exp. Med. 186*:859-865, 1997). The results of these assays are presented in Figures 6A and 6B.

10 EXAMPLE 10

# IDENTIFICATION OF A NATURALLY PROCESSED CTL EPITOPE CONTAINED WITHIN A PROSTATE-SPECIFIC ANTIGEN

The 9-mer peptide p5 (SEQ ID NO: 338) was derived from the P703P antigen (also referred to as P20). The p5 peptide is immunogenic in human HLA-A2 donors and is a naturally processed epitope. Antigen specific human CD8+ T cells can be primed following repeated *in vitro* stimulations with monocytes pulsed with p5 peptide. These CTL specifically recognize p5-pulsed and P703P-transduced target cells in both ELISPOT (as described above) and chromium release assays. Additionally, immunization of HLA-A2Kb transgenic mice with p5 leads to the generation of CTL lines which recognize a variety of HLA-A2Kb or HLA-A2 transduced target cells expressing P703P.

Initial studies demonstrating that p5 is a naturally processed epitope were done using HLA-A2Kb transgenic mice. HLA-A2Kb transgenic mice were immunized subcutaneously in the footpad with 100 µg of p5 peptide together with 140 µg of hepatitis B virus core peptide (a Th peptide) in Freund's incomplete adjuvant. Three weeks post immunization, spleen cells from immunized mice were stimulated *in vitro* with peptide-pulsed LPS blasts. CTL activity was assessed by chromium release assay five days after primary *in vitro* stimulation. Retrovirally transduced cells expressing the control antigen P703P and HLA-A2Kb were used as targets. CTL lines that specifically recognized both p5-pulsed targets as well as P703P-expressing targets were identified.

Human in vitro priming experiments demonstrated that the p5 peptide is immunogenic in humans. Dendritic cells (DC) were differentiated from monocyte cultures derived

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from PBMC of normal human donors by culturing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, the DC were pulsed with 1 ug/ml p5 peptide and cultured with CD8+ T cell enriched PBMC. CTL lines were restimulated on a weekly basis with p5-pulsed monocytes. Five to six weeks after initiation of the CTL cultures, CTL recognition of p5-pulsed target cells was demonstrated. CTL were additionally shown to recognize human cells transduced to express P703P, demonstrating that p5 is a naturally processed epitope.

### **EXAMPLE 11**

# EXPRESSION OF A BREAST TUMOR-DERIVED ANTIGEN

## IN PROSTATE

Isolation of the antigen B305D from breast tumor by differential display is described in US Patent Application No. 08/700,014, filed August 20, 1996. Several different splice forms of this antigen were isolated. The determined cDNA sequences for these splice forms are provided in SEQ ID NO: 366-375, with the predicted amino acid sequences corresponding to the sequences of SEQ ID NO: 292, 298 and 301-303 being provided in SEQ ID NO: 299-306, respectively. In further studies, a splice variant of the cDNA sequence of SEQ ID NO: 366 was isolated which was found to contain an additional guanine residue at position 884 (SEQ ID NO: 530), leading to a frameshift in the open reading frame. The determined DNA sequence of this ORF is provided in SEQ ID NO: 531. This frameshift generates a protein sequence (provided in SEQ ID NO: 532) of 293 amino acids that contains the C-terminal domain common to the other isoforms of B305D but that differs in the N-terminal region.

The expression levels of B305D in a variety of tumor and normal tissues were examined by real time PCR and by Northern analysis. The results indicated that B305D is highly expressed in breast tumor, prostate tumor, normal prostate and normal testes, with expression being low or undetectable in all other tissues examined (colon tumor, lung tumor, ovary tumor, and normal bone marrow, colon, kidney, liver, lung, ovary, skin, small intestine, stomach).

### **EXAMPLE 12**

GENERATION OF HUMAN CTL *IN VITRO* USING WHOLE GENE PRIMING AND STIMULATION TECHNIQUES WITH PROSTATE-SPECIFIC ANTIGEN

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Using in vitro whole-gene priming with P501S-vaccinia infected DC (see, for example, Yee et al, The Journal of Immunology, 157(9):4079-86, 1996), human CTL lines were derived that specifically recognize autologous fibroblasts transduced with P501S (also known as L1-12), as determined by interferon-y ELISPOT analysis as described above. Using a panel of HLA-mismatched B-LCL lines transduced with P501S, these CTL lines were shown to be likely restricted to HLAB class I allele. Specifically, dendritic cells (DC) were differentiated from monocyte cultures derived from PBMC of normal human donors by growing for five days in RPMI medium containing 10% human serum, 50 ng/ml human GM-CSF and 30 ng/ml human IL-4. Following culture, DC were infected overnight with recombinant P501S vaccinia virus at a multiplicity of infection (M.O.I) of five, and matured overnight by the addition of 3 µg/ml CD40 ligand. Virus was inactivated by UV irradiation. CD8+ T cells were isolated using a magnetic bead system, and priming cultures were initiated using standard culture techniques. Cultures were restimulated every 7-10 days using autologous primary fibroblasts retrovirally transduced with P501S and CD80. Following four stimulation cycles, CD8+ T cell lines were identified that specifically produced interferon-γ when stimulated with P501S and CD80-transduced autologous fibroblasts. A panel of HLA-mismatched B-LCL lines transduced with P501S were generated to define the restriction allele of the response. By measuring interferon-y in an ELISPOT assay, the P501S specific response was shown to be likely restricted by HLA B alleles. These results demonstrate that a CD8+ CTL response to P501S can be elicited.

To identify the epitope(s) recognized, cDNA encoding P501S was fragmented by various restriction digests, and sub-cloned into the retroviral expression vector pBIB-KS. Retroviral supernatants were generated by transfection of the helper packaging line Phoenix-Ampho. Supernatants were then used to transduce Jurkat/A2Kb cells for CTL screening. CTL were screened in IFN-gamma ELISPOT assays against these A2Kb targets transduced with the "library" of P501S fragments. Initial positive fragments P501S/H3 and P501S/F2 were sequenced and found to encode amino acids 106-553 and amino acids 136-547, respectively, of SEQ ID NO: 113. A truncation of H3 was made to encode amino acid residues 106-351 of SEQ ID NO: 113, which was unable to stimulate the CTL, thus localizing the epitope to amino acid residues 351-547. Additional fragments encoding amino acids 1-472 (Fragment A) and amino acids 1-351 (Fragment B) were also constructed. Fragment A but not Fragment B stimulated the CTL thus localizing the epitope to amino acid residues 351-472. Overlapping 20-mer and 18-mer peptides representing this region were tested by pulsing Jurkat/A2Kb cells versus CTL in an IFN-gamma assay. Only peptides

P501S-369(20) and P501S-369(18) stimulated the CTL. Nine-mer and 10-mer peptides representing this region were synthesized and similarly tested. Peptide P501S-370 (SEQ ID NO: 539) was the minimal 9-mer giving a strong response. Peptide P501S-376 (SEQ ID NO: 540) also gave a weak response, suggesting that it might represent a cross-reactive epitope.

In subsequent studies, the ability of primary human B cells transduced with P501S to prime MHC class I-restricted, P501S-specific, autologous CD8 T cells was examined. Primary B cells were derived from PBMC of a homozygous HLA-A2 donor by culture in CD40 ligand and IL-4, transduced at high frequency with recombinant P501S in the vector pBIB, and selected with blastocidin-S. For in vitro priming, purified CD8+ T cells were cultured with autologous CD40 ligand + IL-4 derived, P501S-transduced B cells in a 96-well microculture format. These CTL microcultures were re-stimulated with P501S-transduced B cells and then assayed for specificity. Following this initial screen, microcultures with significant signal above background were cloned on autologous EBV-transformed B cells (BLCL), also transduced with P501S. Using IFN-gamma ELISPOT for detection, several of these CD8 T cell clones were found to be specific for P501S, as demonstrated by reactivity to BLCL/P501S but not BLCL transduced with control antigen. It was further demonstrated that the anti-P501S CD8 T cell specificity is HLA-A2-restricted. First, antibody blocking experiments with anti-HLA-A,B,C monoclonal antibody (W6.32), anti-HLA-B,C monoclonal antibody (B1.23.2) and a control monoclonal antibody showed that only the anti-HLA-A,B,C antibody blocked recognition of P501S-expressing autologous BLCL. Secondly, the anti-P501S CTL also recognized an HLA-A2 matched, heterologous BLCL transduced with P501S, but not the corresponding EGFP transduced control BLCL.

#### **EXAMPLE 13**

# IDENTIFICATION OF PROSTATE-SPECIFIC ANTIGENS BY MICROARRAY ANALYSIS

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This Example describes the isolation of certain prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 372 clones were identified, and 319 were successfully sequenced. Table I presents a summary of these clones, which are shown in SEQ ID NOs:385-400. Of these sequences

SEQ ID NOs:386, 389, 390 and 392 correspond to novel genes, and SEQ ID NOs: 393 and 396 correspond to previously identified sequences. The others (SEQ ID NOs:385, 387, 388, 391, 394, 395 and 397-400) correspond to known sequences, as shown in Table I.

Table I
Summary of Prostate Tumor Antigens

Known Genes	Previously Identified Genes	Novel Genes
T-cell gamma chain	P504S	23379 (SEQ ID NO:389)
Kallikrein	P1000C	23399 (SEQ ID NO:392)
Vector	P501S	23320 (SEQ ID NO:386)
CGI-82 protein mRNA (23319; SEQ ID NO:385)	P503S	23381 (SEQ ID NO:390)
PSA	P510S	
Ald. 6 Dehyd.	P784P	
L-iditol-2 dehydrogenase (23376; SEQ ID NO:388)	P502S	
Ets transcription factor PDEF (22672; SEQ ID NO:398)	P706P	
hTGR (22678; SEQ ID NO:399)	19142.2, bangur.seq (22621; SEQ ID NO:396)	
KIAA0295(22685; SEQ ID NO:400)	5566.1 Wang (23404; SEQ ID NO:393)	
Prostatic Acid Phosphatase(22655; SEQ ID NO:397)	P712P	
transglutaminase (22611; SEQ ID NO:395)	P778P	
HDLBP (23508; SEQ ID NO:394)		
CGI-69 Protein(23367; SEQ ID NO:387)		
KIAA0122(23383; SEQ ID NO:391)	·	
TEEG		

CGI-82 showed 4.06 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 43% of prostate tumors, 25% normal prostate, not detected in other normal tissues tested. L-iditol-2 dehydrogenase showed 4.94 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 90% of prostate tumors, 100% of normal prostate, and not detected in other normal tissues tested. Ets transcription factor PDEF showed 5.55 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% prostate tumors, 25% normal prostate and not detected in other normal tissues tested. hTGR1 showed 9.11 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 63% of prostate tumors and is not detected in normal tissues tested including normal prostate. KIAA0295 showed 5.59 fold overexpression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 47% of prostate tumors, low to undetectable in normal tissues tested including normal prostate Prostatic acid phosphatase showed 9.14 fold over-expression in prostate tissues as tissues. compared to other normal tissues tested. It was over-expressed in 67% of prostate tumors, 50% of normal prostate, and not detected in other normal tissues tested. Transglutaminase showed 14.84 fold over-expression in prostate tissues as compared to other normal tissues tested. It was overexpressed in 30% of prostate tumors, 50% of normal prostate, and is not detected in other normal tissues tested. High density lipoprotein binding protein (HDLBP) showed 28.06 fold overexpression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% of normal prostate, and is undetectable in all other normal tissues tested. CGI-69 showed 3.56 fold over-expression in prostate tissues as compared to other normal tissues tested. It is a low abundant gene, detected in more than 90% of prostate tumors, and in 75% normal prostate tissues. The expression of this gene in normal tissues was very low. KIAA0122 showed 4.24 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 57% of prostate tumors, it was undetectable in all normal tissues tested including normal prostate tissues. 19142.2 bangur showed 23.25 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors and 100% of normal prostate. It was undetectable in other normal tissues tested. 5566.1 Wang showed 3.31 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 97% of prostate tumors, 75% normal prostate and was also over-expressed in normal bone marrow, pancreas, and activated PBMC. Novel clone 23379 showed 4.86 fold overexpression in prostate tissues as compared to other normal tissues tested. It was detectable in 97%

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of prostate tumors and 75% normal prostate and is undetectable in all other normal tissues tested. Novel clone 23399 showed 4.09 fold over-expression in prostate tissues as compared to other normal tissues tested. It was over-expressed in 27% of prostate tumors and was undetectable in all normal tissues tested including normal prostate tissues. Novel clone 23320 showed 3.15 fold over-expression in prostate tissues as compared to other normal tissues tested. It was detectable in all prostate tumors and 50% of normal prostate tissues. It was also expressed in normal colon and trachea. Other normal tissues do not express this gene at high level.

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# EXAMPLE 14 IDENTIFICATION OF PROSTATE-SPECIFIC ANTIGENS BY ELECTRONIC SUBTRACTION

This Example describes the use of an electronic subtraction technique to identify prostate-specific antigens.

Potential prostate-specific genes present in the GenBank human EST database were identified by electronic subtraction (similar to that described by Vasmatizis et al., *Proc. Natl. Acad. Sci. USA 95*:300-304, 1998). The sequences of EST clones (43,482) derived from various prostate libraries were obtained from the GenBank public human EST database. Each prostate EST sequence was used as a query sequence in a BLASTN (National Center for Biotechnology Information) search against the human EST database. All matches considered identical (length of matching sequence >100 base pairs, density of identical matches over this region > 70%) were grouped (aligned) together in a cluster. Clusters containing more than 200 ESTs were discarded since they probably represented repetitive elements or highly expressed genes such as those for ribosomal proteins. If two or more clusters shared common ESTs, those clusters were grouped together into a "supercluster," resulting in 4,345 prostate superclusters.

Records for the 479 human cDNA libraries represented in the GenBank release were downloaded to create a database of these cDNA library records. These 479 cDNA libraries were grouped into three groups: Plus (normal prostate and prostate tumor libraries, and breast cell line libraries, in which expression was desired), Minus (libraries from other normal adult tissues, in which expression was not desirable), and Other (libraries from fetal tissue, infant tissue, tissues found only in women, non-prostate tumors and cell lines other than prostate cell lines, in which

expression was considered to be irrelevant). A summary of these library groups is presented in Table II.

<u>Table II</u>
Prostate cDNA Libraries and ESTs

Library	# of Libraries	# of ESTs
Plus	25	43,482
Normal	11	18,875
Tumor	11	21,769
Cell lines	3	2,838
Minus	166	
Other	287	

Each supercluster was analyzed in terms of the ESTs within the supercluster. The tissue source of each EST clone was noted and used to classify the superclusters into four groups:

Type 1- EST clones found in the Plus group libraries only; no expression detected in Minus or Other group libraries; Type 2- EST clones derived from the Plus and Other group libraries only; no expression detected in the Minus group; Type 3- EST clones derived from the Plus, Minus and Other group libraries, but the number of ESTs derived from the Plus group is higher than in either the Minus or Other groups; and Type 4- EST clones derived from Plus, Minus and Other group libraries, but the number derived from the Plus group is higher than the number derived from the Minus group. This analysis identified 4,345 breast clusters (see Table III). From these clusters, 3,172 EST clones were ordered from Research Genetics, Inc., and were received as frozen glycerol stocks in 96-well plates.

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<u>Table III</u> <u>Prostate Cluster Summary</u>

Туре	# of Superclusters	# of ESTs Ordered
1	688	677
2	2899	2484
3	85	11
4	673	0
Total	4345	3172

The EST clone inserts were PCR-amplified using amino-linked PCR primers for Synteni microarray analysis. When more than one PCR product was obtained for a particular clone, that PCR product was not used for expression analysis. In total, 2,528 clones from the electronic subtraction method were analyzed by microarray analysis to identify electronic subtraction breast clones that had high levels of tumor vs. normal tissue mRNA. Such screens were performed using a Synteni (Palo Alto, CA) microarray, according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA 93*:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA 94*:2150-2155, 1997). Within these analyses, the clones were arrayed on the chip, which was then probed with fluorescent probes generated from normal and tumor prostate cDNA, as well as various other normal tissues. The slides were scanned and the fluorescence intensity was measured.

Clones with an expression ratio greater than 3 (i.e., the level in prostate tumor and normal prostate mRNA was at least three times the level in other normal tissue mRNA) were identified as prostate tumor-specific sequences (Table IV). The sequences of these clones are provided in SEQ ID NO: 401-453, with certain novel sequences shown in SEQ ID NO: 407, 413, 416-419, 422, 426, 427 and 450.

<u>Table IV</u> <u>Prostate-tumor Specific Clones</u>

SEQ ID NO.	Sequence	Comments	
	Designation		
401	22545	previously identified P1000C	
402	22547	previously identified P704P	
403	22548	known	
404	22550	known	
405	22551	PSA	
406	22552	prostate secretory protein 94	
407	22553	novel	
408	22558	previously identified P509S	
409	22562	glandular kallikrein	
410	22565	previously identified P1000C	
411	22567	PAP	
412	22568	B1006C (breast tumor antigen)	
413	22570	novel	
414	22571	PSA	
415	22572	previously identified P706P	
416	22573	novel	
417	22574	novel	
418	22575	novel	
419	22580	novel	
420	22581	PAP	
421	22582	prostatic secretory protein 94	
422	22583	novel	
423	22584	prostatic secretory protein 94	
424	22585	prostatic secretory protein 94	
425	22586	known	
426	22587	novel	
427	22588	novel	
. 428	22589	PAP	
429	22590	known	
430	22591	PSA	
431	22592	known	
432	22593	Previously identified P777P	
433	22594	T cell receptor gamma chain	
434	22595	Previously identified P705P	
435	22596	Previously identified P707P	
436	22847	PAP	
437	22848	known	
438	22849	prostatic secretory protein 57	
439	22851	PAP	

440	22852	PAP	
441	22853	PAP	
442	22854	previously identified P509S	
443	22855	previously identified P705P	
444	22856	previously identified P774P	
445	22857	PSA	
446	23601	previously identified P777P	
447	23602	PSA	
448	23605	PSA	
449	23606	PSA	
450	23612	novel	
451	23614	PSA	
452	23618	previously identified P1000C	
453	23622	previously identified P705P	

# EXAMPLE 15 FURTHER IDENTIFICATION OF PROSTATE-SPECIFIC ANTIGENS BY MICROARRAY ANALYSIS

This Example describes the isolation of additional prostate-specific polypeptides from a prostate tumor cDNA library.

A human prostate tumor cDNA expression library as described above was screened using microarray analysis to identify clones that display at least a three fold over-expression in prostate tumor and/or normal prostate tissue, as compared to non-prostate normal tissues (not including testis). 142 clones were identified and sequenced. Certain of these clones are shown in SEQ ID NO: 454-467. Of these sequences, SEQ ID NO: 459-461 represent novel genes. The others (SEQ ID NO: 454-458 and 461-467) correspond to known sequences.

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# EXAMPLE 16 FURTHER CHARACTERIZATION OF PROSTATE-SPECIFIC ANTIGEN P710P

This Example describes the full length cloning of P710P.

The prostate cDNA library described above was screened with the P710P fragment described above. One million colonies were plated on LB/Ampicillin plates. Nylon membrane

filters were used to lift these colonies, and the cDNAs picked up by these filters were then denatured and cross-linked to the filters by UV light. The P710P fragment was radiolabeled and used to hybridize with the filters. Positive cDNA clones were selected and their cDNAs recovered and sequenced by an automatic Perkin Elmer/Applied Biosystems Division Sequencer. Four sequences were obtained, and are presented in SEQ ID NO: 468-471 These sequences appear to represent different splice variants of the P710P gene.

## **EXAMPLE 17**

# PROTEIN EXPRESSION OF THE PROSTATE-SPECIFIC ANTIGEN P501S

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This example describes the expression and purification of the prostate-specific antigen P501S in *E. coli*, baculovirus and mammalian cells.

## a) Expression in E. coli

Expression of the full-length form of P501S was attempted by first cloning P501S without the leader sequence (amino acids 36-553 of SEQ ID NO: 113) downstream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 (SEQ ID NO: 484) in pET17b. Specifically, P501S DNA was used to perform PCR using the primers AW025 (SEQ ID NO: 485) and AW003 (SEQ ID NO: 486). AW025 is a sense cloning primer that contains a HindIII site. AW003 is an antisense cloning primer that contains an EcoRI site. DNA amplification was performed using 5 μl 10X Pfu buffer, 1 μl 20 mM dNTPs, 1 μl each of the PCR primers at 10 μM concentration, 40 μl water, 1 μl Pfu DNA polymerase (Stratagene, La Jolla, CA) and 1 μl DNA at 100 ng/μl. Denaturation at 95°C was performed for 30 sec, followed by 10 cycles of 95°C for 30 sec, 60°C for 1 min and by 72°C for 3 min. 20 cycles of 95°C for 30 sec, 65°C for 1 min and by 72°C for 3 min, and lastly by 1 cycle of 72°C for 10 min. The PCR product was cloned to Ra12m/pET17b using HindIII and EcoRI. The sequence of the resulting fusion construct (referred to as Ra12-P501S-F) was confirmed by DNA sequencing.

The fusion construct was transformed into BL21(DE3)pLysE, pLysS and CodonPlus E. coli (Stratagene) and grown overnight in LB broth with kanamycin. The resulting culture was induced with IPTG. Protein was transferred to PVDF membrane and blocked with 5% non-fat milk (in PBS-Tween buffer), washed three times and incubated with mouse anti-His tag antibody (Clontech) for 1 hour. The membrane was washed 3 times and probed with HRP-Protein A

(Zymed) for 30 min. Finally, the membrane was washed 3 times and developed with ECL (Amersham). No expression was detected by Western blot. Similarly, no expression was detected by Western blot when the Ra12-P501S-F fusion was used for expression in BL21CodonPlus by CE6 phage (Invitrogen).

An N-terminal fragment of P501S (amino acids 36-325 of SEQ ID NO: 113) was cloned down-stream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 in pET17b as follows. P501S DNA was used to perform PCR using the primers AW025 (SEQ ID NO: 485) and AW027 (SEQ ID NO: 487). AW027 is an antisense cloning primer that contains an EcoRI site and a stop codon. DNA amplification was performed essentially as described above. The resulting PCR product was cloned to Ra12 in pET17b at the HindIII and EcoRI sites. The fusion construct (referred to as Ra12-P501S-N) was confirmed by DNA sequencing.

The Ra12-P501S-N fusion construct was used for expression in BL21(DE3)pLysE, pLysS and CodonPlus, essentially as described above. Using Western blot analysis, protein bands were observed at the expected molecular weight of 36 kDa. Some high molecular weight bands were also observed, probably due to aggregation of the recombinant protein. No expression was detected by Western blot when the Ra12-P501S-F fusion was used for expression in BL21CodonPlus by CE6 phage.

A fusion construct comprising a C-terminal portion of P501S (amino acids 257-553 of SEQ ID NO: 113) located down-stream of the first 30 amino acids of the *M. tuberculosis* antigen Ra12 (SEQ ID NO: 484) was prepared as follows. P501S DNA was used to perform PCR using the primers AW026 (SEQ ID NO: 488) and AW003 (SEQ ID NO: 486). AW026 is a sense cloning primer that contains a HindIII site. DNA amplification was performed essentially as described above. The resulting PCR product was cloned to Ra12 in pET17b at the HindIII and EcoRI sites. The sequence for the fusion construct (referred to as Ra12-P501S-C) was confirmed.

The Ra12-P501S-C fusion construct was used for expression in BL21(DE3)pLysE, pLysS and CodonPlus, as described above. A small amount of protein was detected by Western blot, with some molecular weight aggregates also being observed. Expression was also detected by Western blot when the Ra12-P501S-C fusion was used for expression in BL21CodonPlus induced by CE6 phage.

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# b) Expression of P501S in Baculovirus

The Bac-to-Bac baculovirus expression system (BRL Life Technologies, Inc.) was used to express P501S protein in insect cells. Full-length P501S (SEQ ID NO: 113) was amplified by PCR and cloned into the XbaI site of the donor plasmid pFastBacI. The recombinant bacmid and baculovirus were prepared according to the manufacturer's isntructions. The recombinant baculovirus was amplified in Sf9 cells and the high titer viral stocks were utilized to infect High Five cells (Invitrogen) to make the recombinant protein. The identity of the full-length protein was confirmed by N-terminal sequencing of the recombinant protein and by Western blot analysis (Figure 7). Specifically, 0.6 million High Five cells in 6-well plates were infected with either the unrelated control virus BV/ECD\_PD (lane 2), with recombinant baculovirus for P501S at different amounts or MOIs (lanes 4-8), or were uninfected (lane 3). Cell lysates were run on SDS-PAGE under reducing conditions and analyzed by Western blot with the anti-P501S monoclonal antibody P501S-10E3-G4D3 (prepared as described below). Lane 1 is the biotinylated protein molecular weight marker (BioLabs).

The localization of recombinant P501S in the insect cells was investigated as follows. The insect cells overexpressing P501S were fractionated into fractions of nucleus, mitochondria, membrane and cytosol. Equal amounts of protein from each fraction were analyzed by Western blot with a monoclonal antibody against P501S. Due to the scheme of fractionation, both nucleus and mitochondria fractions contain some plasma membrane components. However, the membrane fraction is basically free from mitochondria and nucleus. P501S was found to be present in all fractions that contain the membrane component, suggesting that P501S may be associated with plasma membrane of the insect cells expressing the recombinant protein.

# 25 c) Expression of P501S in mammalian cells

Full-length P501S (553AA) was cloned into various mammalian expression vectors, including pCEP4 (Invitrogen), pVR1012 (Vical, San Diego, CA) and a modified form of the retroviral vector pBMN, referred to as pBIB. Transfection of P501S/pCEP4 and P501S/pVR1012 into HEK293 fibroblasts was carried out using the Fugene transfection reagent (Boehringer Mannheim). Briefly, 2 ul of Fugene reagent was diluted into 100 ul of serum-free media and incubated at room temperature for 5-10 min. This mixture was added to 1 ug of P501S plasmid DNA, mixed briefly and incubated for 30 minutes at room temperature. The Fugene/DNA mixture

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was added to cells and incubated for 24-48 hours. Expression of recombinant P501S in transfected HEK293 fibroblasts was detected by means of Western blot employing a monoclonal antibody to P501S.

Transfection of p501S/pCEP4 into CHO-K cells (American Type Culture Collection, Rockville, MD) was carried out using GenePorter transfection reagent (Gene Therapy Systems, San Diego, CA). Briefly, 15 µl of GenePorter was diluted in 500 µl of serum-free media and incubated at room temperature for 10 min. The GenePorter/media mixture was added to 2 µg of plasmid DNA that was diluted in 500 µl of serum-free media, mixed briefly and incubated for 30 min at room temperature. CHO-K cells were rinsed in PBS to remove serum proteins, and the GenePorter/DNA mix was added and incubated for 5 hours. The transfected cells were then fed an equal volume of 2x media and incubated for 24-48 hours.

FACS analysis of P501S transiently infected CHO-K cells, demonstrated surface expression of P501S. Expression was detected using rabbit polyclonal antisera raised against a P501S peptide, as described below. Flow cytometric analysis was performed using a FaCScan (Becton Dickinson), and the data were analyzed using the Cell Quest program.

### **EXAMPLE 18**

# PREPARATION AND CHARACTERIZATION OF ANTIBODIES AGAINST PROSTATE-SPECIFIC POLYPEPTIDES

## 20 a) Preparation and Characterization of Antibodies against P501S

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A murine monoclonal antibody directed against the carboxy-terminus of the prostate-specific antigen P501S was prepared as follows.

A truncated fragment of P501S (amino acids 355-526 of SEQ ID NO: 113) was generated and cloned into the pET28b vector (Novagen) and expressed in *E. coli* as a thioredoxin fusion protein with a histidine tag. The trx-P501S fusion protein was purified by nickel chromatography, digested with thrombin to remove the trx fragment and further purified by an acid precipitation procedure followed by reverse phase HPLC.

Mice were immunized with truncated P501S protein. Serum bleeds from mice that potentially contained anti-P501S polyclonal sera were tested for P501S-specific reactivity using ELISA assays with purified P501S and trx-P501S proteins. Serum bleeds that appeared to react specifically with P501S were then screened for P501S reactivity by Western analysis. Mice that contained a P501S-specific antibody component were sacrificed and spleen cells were used to

generate anti-P501S antibody producing hybridomas using standard techniques. Hybridoma supernatants were tested for P501S-specific reactivity initially by ELISA, and subsequently by FACS analysis of reactivity with P501S transduced cells. Based on these results, a monoclonal hybridoma referred to as 10E3 was chosen for further subcloning. A number of subclones were generated, tested for specific reactivity to P501S using ELISA and typed for IgG isotype. The results of this analysis are shown below in Table V. Of the 16 subclones tested, the monoclonal antibody 10E3-G4-D3 was selected for further study.

<u>Table V</u>

<u>Isotype analysis of murine anti-P501S monoclonal antibodies</u>

Hybridoma clone	Isotype	Estimated [Ig] in supernatant (µg/ml)
4D11	IgG1	14.6
1G1	IgGl	0.6
4F6	IgG1	72
4H5	IgG1	13.8
4H5-E12	IgG1	10.7
4H5-EH2	IgG1	9.2
4H5-H2-A10	IgG1	10
4H5-H2-A3	IgG1	12.8
4H5-H2-A10-G6	IgG1	13.6
4H5-H2-B11	IgG1	12.3
10E3	IgG2a	3.4
10E3-D4	IgG2a	3.8
10E3-D4-G3	IgG2a	9.5
10E3-D4-G6	IgG2a	10.4
10E3-E7	IgG2a	6.5
8H12	IgG2a	0.6

The specificity of 10E3-G4-D3 for P501S was examined by FACS analysis.

Specifically, cells were fixed (2% formaldehyde, 10 minutes), permeabilized (0.1% saponin, 10 minutes) and stained with 10E3-G4-D3 at 0.5 – 1 µg/ml, followed by incubation with a secondary, FITC-conjugated goat anti-mouse Ig antibody (Pharmingen, San Diego, CA). Cells were then analyzed for FITC fluorescence using an Excalibur fluorescence activated cell sorter. For FACS analysis of transduced cells, B-LCL were retrovirally transduced with P501S. For analysis of infected cells, B-LCL were infected with a vaccinia vector that expresses P501S. To demonstrate

specificity in these assays, B-LCL transduced with a different antigen (P703P) and uninfected B-LCL vectors were utilized. 10E3-G4-D3 was shown to bind with P501S-transduced B-LCL and also with P501S-infected B-LCL, but not with either uninfected cells or P703P-transduced cells.

To determine whether the epitope recognized by 10E3-G4-D3 was found on the surface or in an intracellular compartment of cells, B-LCL were transduced with P501S or HLA-B8 as a control antigen and either fixed and permeabilized as described above or directly stained with 10E3-G4-D3 and analyzed as above. Specific recognition of P501S by 10E3-G4-D3 was found to require permeabilization, suggesting that the epitope recognized by this antibody is intracellular.

The reactivity of 10E3-G4-D3 with the three prostate tumor cell lines Lncap, PC-3 and DU-145, which are known to express high, medium and very low levels of P501S, respectively, was examined by permeabilizing the cells and treating them as described above. Higher reactivity of 10E3-G4-D3 was seen with Lncap than with PC-3, which in turn showed higher reactivity that DU-145. These results are in agreement with the real time PCR and demonstrate that the antibody specifically recognizes P501S in these tumor cell lines and that the epitope recognized in prostate tumor cell lines is also intracellular.

Specificity of 10E3-G4-D3 for P501S was also demonstrated by Western blot analysis. Lysates from the prostate tumor cell lines Lncap, DU-145 and PC-3, from P501S-transiently transfected HEK293 cells, and from non-transfected HEK293 cells were generated. Western blot analysis of these lysates with 10E3-G4-D3 revealed a 46 kDa immunoreactive band in Lncap, PC-3 and P501S-transfected HEK cells, but not in DU-145 cells or non-transfected HEK293 cells. P501S mRNA expression is consistent with these results since semi-quantitative PCR analysis revealed that P501S mRNA is expressed in Lncap, to a lesser but detectable level in PC-3 and not at all in DU-145 cells. Bacterially expressed and purified recombinant P501S (referred to as P501SStr2) was recognized by 10E3-G4-D3 (24 kDa), as was full-length P501S that was transiently expressed in HEK293 cells using either the expression vector VR1012 or pCEP4. Although the predicted molecular weight of P501S is 60.5 kDa, both transfected and "native" P501S run at a slightly lower mobility due to its hydrophobic nature.

Immunohistochemical analysis was performed on prostate tumor and a panel of normal tissue sections (prostate, adrenal, breast, cervix, colon, duodenum, gall bladder, ileum, kidney, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis). Tissue samples were fixed in formalin solution for 24 hours and embedded in paraffin before being sliced into 10 micron sections. Tissue sections were permeabilized and incubated with 10E3-G4-D3 antibody for 1 hr.

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HRP-labeled anti-mouse followed by incubation with DAB chromogen was used to visualize P501S immunoreactivity. P501S was found to be highly expressed in both normal prostate and prostate tumor tissue but was not detected in any of the other tissues tested.

To identify the epitope recognized by 10E3-G4-D3, an epitope mapping approach was pursued. A series of 13 overlapping 20-21 mers (5 amino acid overlap; SEQ ID NO: 489-501) was synthesized that spanned the fragment of P501S used to generate 10E3-G4-D3. Flat bottom 96 well microtiter plates were coated with either the peptides or the P501S fragment used to immunize mice, at 1 microgram/ml for 2 hours at 37 °C. Wells were then aspirated and blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature, and subsequently washed in PBS containing 0.1% Tween 20 (PBST). Purified antibody 10E3-G4-D3 was added at 2 fold dilutions (1000 ng - 16 ng) in PBST and incubated for 30 minutes at room temperature. This was followed by washing 6 times with PBST and subsequently incubating with (H+L)Affinipure F(ab') fragment donkey anti-mouse IgG HRP-conjugated Immunoresearch, West Grove, PA) at 1:20000 for 30 minutes. Plates were then washed and incubated for 15 minutes in tetramethyl benzidine. Reactions were stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using an ELISA plate reader. As shown in Fig. 8, reactivity was seen with the peptide of SEQ ID NO: 496 (corresponding to amino acids 439-459 of P501S) and with the P501S fragment but not with the remaining peptides, demonstrating that the epitope recognized by 10E3-G4-D3 is localized to amino acids 439-459 of SEQ ID NO: 113.

In order to further evaluate the tissue specificity of P501S, multi-array immunohistochemical analysis was performed on approximately 4700 different human tissues encompassing all the major normal organs as well as neoplasias derived from these tissues. Sixty-five of these human tissue samples were of prostate origin. Tissue sections 0.6 mm in diameter were formalin-fixed and paraffin embedded. Samples were pretreated with HIER using 10 mM citrate buffer pH 6.0 and boiling for 10 min. Sections were stained with 10E3-G4-D3 and P501S immunoreactivity was visualized with HRP. All the 65 prostate tissues samples (5 normal, 55 untreated prostate tumors, 5 hormone refractory prostate tumors) were positive, showing distinct perinuclear staining. All other tissues examined were negative for P501S expression.

## b) Preparation and Characterization of Antibodies against P503S

A fragment of P503S (amino acids 113-241 of SEQ ID NO: 114) was expressed and purified from bacteria essentially as described above for P501S and used to immunize both rabbits

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and mice. Mouse monoclonal antibodies were isolated using standard hybridoma technology as described above. Rabbit monoclonal antibodies were isolated using Selected Lymphocyte Antibody Method (SLAM) technology at Immgenics Pharmaceuticals (Vancouver, BC, Canada). Table VI, below, lists the monoclonal antibodies that were developed against P503S.

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Table VI

Antibody	Species
20D4	Rabbit
JA1	Rabbit
1A4	Mouse
1C3`	Mouse
1C9	Mouse
1D12	Mouse
2A11	Mouse
2H9	Mouse
4H7	Mouse
8A8	Mouse
8D10	Mouse
9C12	Mouse
6D12	Mouse

The DNA sequences encoding the complementarity determining regions (CDRs) for the rabbit monoclonal antibodies 20D4 and JA1 were determined and are provided in SEQ ID NO: 502 and 503, respectively.

In order to better define the epitope binding region of each of the antibodies, a series of overlapping peptides were generated that span amino acids 109-213 of SEQ ID NO: 114. These peptides were used to epitope map the anti-P503S monoclonal antibodies by ELISA as follows. The recombinant fragment of P503S that was employed as the immunogen was used as a positive control. Ninety-six well microtiter plates were coated with either peptide or recombinant antigen at 20 ng/well overnight at 4 °C. Plates were aspirated and blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature then washed in PBS containing 0.1% Tween 20 (PBST). Purified rabbit monoclonal antibodies diluted in PBST were added to the wells and incubated for 30 min at room temperature. This was followed by washing 6 times with PBST and incubation with Protein-A HRP conjugate at a 1:2000 dilution for a further 30 min. Plates were washed six times in PBST and incubated with tetramethylbenzidine (TMB) substrate for a further

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15 min. The reaction was stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using at ELISA plate reader. ELISA with the mouse monoclonal antibodies was performed with supernatants from tissue culture run neat in the assay.

All of the antibodies bound to the recombinant P503S fragment, with the exception of the negative control SP2 supernatant. 20D4, JA1 and 1D12 bound strictly to peptide #2101 (SEQ ID NO: 504), which corresponds to amino acids 151-169 of SEQ ID NO: 114. 1C3 bound to peptide #2102 (SEQ ID NO: 505), which corresponds to amino acids 165-184 of SEQ ID NO: 114. 9C12 bound to peptide #2099 (SEQ ID NO: 522), which corresponds to amino acids 120-139 of SEQ ID NO: 114. The other antibodies bind to regions that were not examined in these studies.

Subsequent to epitope mapping, the antibodies were tested by FACS analysis on a cell line that stably expressed P503S to confirm that the antibodies bind to cell surface epitopes. Cells stably transfected with a control plasmid were employed as a negative control. Cells were stained live with no fixative. 0.5 ug of anti-P503S monoclonal antibody was added and cells were incubated on ice for 30 min before being washed twice and incubated with a FITC-labelled goat anti-rabbit or mouse secondary antibody for 20 min. After being washed twice, cells were analyzed with an Excalibur fluorescent activated cell sorter. The monoclonal antibodies 1C3, 1D12, 9C12, 20D4 and JA1, but not 8D3, were found to bind to a cell surface epitope of P503S.

In order to determine which tissues express P503S, immunohistochemical analysis was performed, essentially as described above, on a panel of normal tissues (prostate, adrenal, breast, cervix, colon, duodenum, gall bladder, ileum, kidney, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis). HRP-labeled anti-mouse or anti-rabbit antibody followed by incubation with TMB was used to visualize P503S immunoreactivity. P503S was found to be highly expressed in prostate tissue, with lower levels of expression being observed in cervix, colon, ileum and kidney, and no expression being observed in adrenal, breast, duodenum, gall bladder, ovary, pancreas, parotid gland, skeletal muscle, spleen and testis.

Western blot analysis was used to characterize anti-P503S monoclonal antibody specificity. SDS-PAGE was performed on recombinant (rec) P503S expressed in and purified from bacteria and on lysates from HEK293 cells transfected with full length P503S. Protein was transferred to nitrocellulose and then Western blotted with each of the anti-P503S monoclonal antibodies (20D4, JA1, 1D12, 6D12 and 9C12) at an antibody concentration of 1 ug/ml. Protein was detected using horse radish peroxidase (HRP) conjugated to either a goat anti-mouse monoclonal antibody or to protein A-sepharose. The monoclonal antibody 20D4 detected the

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appropriate molecular weight 14 kDa recombinant P503S (amino acids 113-241) and the 23.5 kDa species in the HEK293 cell lysates transfected with full length P503S. Other anti-P503S monoclonal antibodies displayed similar specificity by Western blot.

# 5 c) Preparation and Characterization of Antibodies against P703P

Rabbits were immunized with either a truncated (P703Ptr1; SEQ ID NO: 172) or full-length mature form (P703Pfl; SEQ ID NO: 523) of recombinant P703P protein was expressed in and purified from bacteria as described above. Affinity purified polyclonal antibody was generated using immunogen P703Pfl or P703Ptr1 attached to a solid support. Rabbit monoclonal antibodies were isolated using SLAM technology at Immgenics Pharmaceuticals. Table VII below lists both the polyclonal and monoclonal antibodies that were generated against P703P.

Table VII

Antibody	Immunogen	Species/type
Aff. Purif. P703P (truncated); #2594	P703Ptrl	Rabbit polyclonal
Aff. Purif. P703P (full length); #9245	P703Pfl	Rabbit polyclonal
2D4	P703Ptrl	Rabbit monoclonal
8H2	P703Ptrl	Rabbit monoclonal
7H8	P703Ptrl	Rabbit monoclonal

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The DNA sequences encoding the complementarity determining regions (CDRs) for the rabbit monoclonal antibodies 8H2, 7H8 and 2D4 were determined and are provided in SEQ ID NO: 506-508, respectively.

Epitope mapping studies were performed as described above. Monoclonal antibodies 2D4 and 7H8 were found to specifically bind to the peptides of SEQ ID NO: 509 (corresponding to amino acids 145-159 of SEQ ID NO: 172) and SEQ ID NO: 510 (corresponding to amino acids 11-25 of SEQ ID NO: 172), respectively. The polyclonal antibody 2594 was found to bind to the peptides of SEQ ID NO: 511-514, with the polyclonal antibody 9427 binding to the peptides of SEQ ID NO: 515-517.

The specificity of the anti-P703P antibodies was determined by Western blot analysis as follows. SDS-PAGE was performed on (1) bacterially expressed recombinant antigen; (2) lysates of HEK293 cells and Ltk-/- cells either untransfected or transfected with a plasmid

expressing full length P703P; and (3) supernatant isolated from these cell cultures. Protein was transferred to nitrocellulose and then Western blotted using the anti-P703P polyclonal antibody #2594 at an antibody concentration of 1 ug/ml. Protein was detected using horse radish peroxidase (HRP) conjugated to an anti-rabbit antibody. A 35 kDa immunoreactive band could be observed with recombinant P703P. Recombinant P703P runs at a slightly higher molecular weight since it is epitope tagged. In lysates and supernatants from cells transfected with full length P703P, a 30 kDa band corresponding to P703P was observed. To assure specificity, lysates from HEK293 cells stably transfected with a control plasmid were also tested and were negative for P703P expression. Other anti-P703P antibodies showed similar results.

Immunohistochemical studies were performed as described above, using anti-P703P monoclonal antibody. P703P was found to be expressed at high levels in normal prostate and prostate tumor tissue but was not detectable in all other tissues tested (breast tumor, lung tumor and normal kidney).

15 EXAMPLE 19

# CHARACTERIZATION OF CELL SURFACE EXPRESSION AND CHROMOSOME LOCALIZATION OF THE PROSTATE-SPECIFIC ANTIGEN P501S

This example describes studies demonstrating that the prostate-specific antigen P501S is expressed on the surface of cells, together with studies to determine the probable chromosomal location of P501S.

The protein P501S (SEQ ID NO: 113) is predicted to have 11 transmembrane domains. Based on the discovery that the epitope recognized by the anti-P501S monoclonal antibody 10E3-G4-D3 (described above in Example 17) is intracellular, it was predicted that following transmembrane determinants would allow the prediction of extracellular domains of P501S. Fig. 9 is a schematic representation of the P501S protein showing the predicted location of the transmembrane domains and the intracellular epitope described in Example 17. Underlined sequence represents the predicted transmembrane domains, bold sequence represents the predicted extracellular domains, and italized sequence represents the predicted intracellular domains. Sequence that is both bold and underlined represents sequence employed to generate polyclonal rabbit serum. The location of the transmembrane domains was predicted using HHMTOP as

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described by Tusnady and Simon (Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to Topology Prediction, *J. Mol. Biol.* 283:489-506, 1998).

Based on Fig. 9, the P501S domain flanked by the transmembrane domains corresponding to amino acids 274-295 and 323-342 is predicted to be extracellular. The peptide of SEQ ID NO: 518 corresponds to amino acids 306-320 of P501S and lies in the predicted extracellular domain. The peptide of SEQ ID NO: 519, which is identical to the peptide of SEQ ID NO: 518 with the exception of the substitution of the histidine with an asparginine, was synthesized as described above. A Cys-Gly was added to the C-terminus of the peptide to facilitate conjugation to the carrier protein. Cleavage of the peptide from the solid support was carried out using the following cleavage mixture: trifluoroacetic acid:ethanediol:thioanisol:water:phenol (40:1:2:2:3). After cleaving for two hours, the peptide was precipitated in cold ether. The peptide pellet was then dissolved in 10% v/v acetic acid and lyophilized prior to purification by C18 reverse phase hplc. A gradient of 5-60% acetonitrile (containing 0.05% TFA) in water (containing 0.05% TFA) was used to elute the peptide. The purity of the peptide was verified by hplc and mass spectrometry, and was determined to be >95%. The purified peptide was used to generate rabbit polyclonal antisera as described above.

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Surface expression of P501S was examined by FACS analysis. Cells were stained with the polyclonal anti-P501S peptide serum at 10 µg/ml, washed, incubated with a secondary FITC-conjugated goat anti-rabbit Ig antibody (ICN), washed and analyzed for FITC fluorescence using an Excalibur fluorescence activated cell sorter. For FACS analysis of transduced cells, B-LCL were retrovirally transduced with P501S. To demonstrate specificity in these assays, B-LCL transduced with an irrelevant antigen (P703P) or nontransduced were stained in parallel. For FACS analysis of prostate tumor cell lines, Lncap, PC-3 and DU-145 were utilized. Prostate tumor cell lines were dissociated from tissue culture plates using cell dissociation medium and stained as above. All samples were treated with propidium iodide (PI) prior to FACS analysis, and data was obtained from PI-excluding (i.e. intact and non-permeabilized) cells. The rabbit polyclonal serum generated against the peptide of SEQ ID NO: 519 was shown to specifically recognize the surface of cells transduced to express P501S, demonstrating that the epitope recognized by the polyclonal serum is extracellular.

To determine biochemically if P501S is expressed on the cell surface, peripheral membranes from Lncap cells were isolated and subjected to Western blot analysis. Specifically, Lncap cells were lysed using a dounce homogenizer in 5 ml of homogenization buffer (250 mM)

sucrose, 10 mM HEPES, 1mM EDTA, pH 8.0, 1 complete protease inhibitor tablet (Boehringer Mannheim)). Lysate samples were spun at 1000 g for 5 min at 4 °C. The supernatant was then spun at 8000g for 10 min at 4 °C. Supernatant from the 8000g spin was recovered and subjected to a 100,000g spin for 30 min at 4 °C to recover peripheral membrane. Samples were then separated by SDS-PAGE and Western blotted with the mouse monoclonal antibody 10E3-G4-D3 (described above in Example 17) using conditions described above. Recombinant purified P501S, as well as HEK293 cells transfected with and over-expressing P501S were included as positive controls for P501S detection. LCL cell lysate was included as a negative control. P501S could be detected in Lncap total cell lysate, the 8000g (internal membrane) fraction and also in the 100,000g (plasma membrane) fraction. These results indicate that P501S is expressed at, and localizes to, the peripheral membrane.

To demonstrate that the rabbit polyclonal antiserum generated to the peptide of SEQ ID NO: 519 specifically recognizes this peptide as well as the corresponding native peptide of SEQ ID NO: 518, ELISA analyses were performed. For these analyses, flat-bottomed 96 well microtiter plates were coated with either the peptide of SEQ ID NO: 519, the longer peptide of SEO ID NO: 520 that spans the entire predicted extracellular domain, the peptide of SEQ ID NO: 521 which represents the epitope recognized by the P501S-specific antibody 10E3-G4-D3, or a P501S fragment (corresponding to amino acids 355-526 of SEQ ID NO: 113) that does not include the immunizing peptide sequence, at 1 µg/ml for 2 hours at 37 °C. Wells were aspirated, blocked with phosphate buffered saline containing 1% (w/v) BSA for 2 hours at room temperature and subsequently washed in PBS containing 0.1% Tween 20 (PBST). Purified anti-P501S polyclonal rabbit serum was added at 2 fold dilutions (1000 ng - 125 ng) in PBST and incubated for 30 min at room temperature. This was followed by washing 6 times with PBST and incubating with HRPconjugated goat anti-rabbit IgG (H+L) Affinipure F(ab') fragment at 1:20000 for 30 min. Plates were then washed and incubated for 15 min in tetramethyl benzidine. Reactions were stopped by the addition of 1N sulfuric acid and plates were read at 450 nm using an ELISA plate reader. As shown in Fig. 11, the anti-P501S polyclonal rabbit serum specifically recognized the peptide of SEQ ID NO: 519 used in the immunization as well as the longer peptide of SEQ ID NO: 520, but did not recognize the irrelevant P501S-derived peptides and fragments.

In further studies, rabbits were immunized with peptides derived from the P501S sequence and predicted to be either extracellular or intracellular, as shown in Fig. 9. Polyclonal rabbit sera were isolated and polyclonal antibodies in the serum were purified, as described above.

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To determine specific reactivity with P501S, FACS analysis was employed, utilizing either B-LCL transduced with P501S or the irrelevant antigen P703P, of B-LCL infected with vaccinia virus-expressing P501S. For surface expression, dead and non-intact cells were excluded from the analysis as described above. For intracellular staining, cells were fixed and permeabilized as described above. Rabbit polyclonal serum generated against the peptide of SEQ ID NO: 548, which corresponds to amino acids 181-198 of P501S, was found to recognize a surface epitope of P501S. Rabbit polyclonal serum generated against the peptide SEQ ID NO: 551, which corresponds to amino acids 543-553 of P501S, was found to recognize an epitope that was either potentially extracellular or intracellular since in different experiments intact or permeabilized cells were recognized by the polyclonal sera. Based on similar deductive reasoning, the sequences of SEQ ID NO: 541-547, 549 and 550, which correspond to amino acids 109-122, 539-553, 509-520, 37-54, 342-359, 295-323, 217-274, 143-160 and 75-88, respectively, of P501S, can be considered to be potential surface epitopes of P501S recognized by antibodies.

The chromosomal location of P501S was determined using the GeneBridge 4 Radiation Hybrid panel (Research Genetics). The PCR primers of SEQ ID NO: 528 and 529 were employed in PCR with DNA pools from the hybrid panel according to the manufacturer's directions. After 38 cycles of amplification, the reaction products were separated on a 1.2% agarose gel, and the results were analyzed through the Whitehead Institute/MIT Center for Genome Research web server (http://www-genome.wi.mit.edu/cgi-bin/contig/rhmapper.pl) to determine the probable chromosomal location. Using this approach, P501S was mapped to the long arm of chromosome 1 at WI-9641 between q32 and q42. This region of chromosome 1 has been linked to prostate cancer susceptibility in hereditary prostate cancer (Smith et al. Science 274:1371-1374, 1996 and Berthon et al. Am. J. Hum. Genet. 62:1416-1424, 1998). These results suggest that P501S may play a role in prostate cancer malignancy.

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From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the present invention is not limited except as by the appended claims.

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#### **CLAIMS**

- 1. An isolated polypeptide comprising at least an immunogenic portion of a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:
- (a) sequences recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536;
  - (b) sequences that hybridize to any of the foregoing sequences under moderately stringent conditions; and
    - (c) complements of any of the sequence of (a) or (b).
- An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID No: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotide sequences.
  - 3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 108, 112, 113, 114, 172, 176, 178, 327, 329, 331, 339, 383, 477-483, 496, 504, 505, 519, 520, 522, 525, 527, 532, 534 and 537-550.

4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a prostate-specific protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing sequences.

- 5. An isolated polynucleotide encoding a prostate-specific protein, or a variant thereof, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing sequences.
- 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536.

- 7. An isolated polynucleotide comprising a sequence that hybridizes under moderately stringent conditions to a sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536.
- 8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.
  - 9. An expression vector comprising a polynucleotide according to any one of claims 4-8.

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10. A host cell transformed or transfected with an expression vector according to claim 9.

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11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a prostate-specific protein, the protein comprising an amino acid sequence encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-471, 472-476, 524, 526, 530, 531, 533, 535 and 536 or a complement of any of the foregoing polynucleotide sequences.

12. A monoclonal antibody that specifically binds to an amino acid sequence selected from the group consisting of SEQ ID NO: 496, 504, 505, 509-517, 519, 520, 522 and 539-551.

- 5 13. A monoclonal antibody comprising a complementarity determining region selected from the group consisting of SEQ ID NO: 502, 503 and 506-508.
- 14. A fusion protein comprising at least one polypeptide according to 10 claim 1.
  - 15. A fusion protein according to claim 14, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

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- 16. A fusion protein according to claim 14, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.
- 17. A fusion protein according to claim 14, wherein the fusion protein 20 comprises an affinity tag.
  - 18. An isolated polynucleotide encoding a fusion protein according to claim 14.
- 25 19.. A pharmaceutical composition comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:
  - (a) a polypeptide according to claim 1;
  - (b) a polynucleotide according to claim 4;
  - (c) an antibody according to any one of claims 11-13;
  - (d) a fusion protein according to claim 14; and

- (e) a polynucleotide according to claim 18.
- 20. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:
  - (a) a polypeptide according to claim 1;
  - (b) a polynucleotide according to claim 4;
  - (c) an antibody according to any one of claims 11-13;
  - (d) a fusion protein according to claim 14; and
  - (e) a polynucleotide according to claim 18.

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- 21. A vaccine according to claim 20, wherein the immunostimulant is an adjuvant.
- 22. A vaccine according to claim 20, wherein the immunostimulant induces a predominantly Type I response.
  - 23. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 19.

- 24. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.
- 25. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.
  - 26. A pharmaceutical composition according to claim 25, wherein the antigen presenting cell is a dendritic cell or a macrophage.

27. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

- 5 28. A vaccine according to claim 27, wherein the immunostimulant is an adjuvant.
  - 29. A vaccine according to claim 27, wherein the immunostimulant induces a predominantly Type I response.

30. A vaccine according to claim 27, wherein the antigen-presenting cell is a dendritic cell.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, and thereby inhibiting the development of a cancer in the patient.

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- 32. A method according to claim 31, wherein the antigen-presenting cell is a dendritic cell.
- 33. A method according to any one of claims 23, 24 and 31, wherein the cancer is prostate cancer.
  - 34. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536; and

- (ii) complements of the foregoing polynucleotides;
- wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the prostate-specific protein from the sample.
- 35. A method according to claim 34, wherein the biological sample is blood or a fraction thereof.
  - 36. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

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- 37. A method for stimulating and/or expanding T cells specific for a prostate-specific protein, comprising contacting T cells with at least one component selected from the group consisting of:
  - (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
  - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
  - (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii), under conditions and for a time sufficient to permit the stimulation and/or

expansion of T cells.

38. An isolated T cell population, comprising T cells prepared according to the method of claim 37.

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39. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 38.

- 40. A method for inhibiting the development of a cancer in a patient, comprising the steps of:
- (a) incubating CD4<sup>+</sup> and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:
  - (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
  - (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or
  - (iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate; and

- (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.
- 41. A method for inhibiting the development of a cancer in a patient, comprising the steps of:
- (a) incubating CD4<sup>+</sup> and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:
  - (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536;
- 30 (iii) a polynucleotide encoding a polypeptide of (i) or (ii); or

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(iv) an antigen-presenting cell that expresses a polypeptide of (i) or (ii);

such that T cells proliferate;

- (b) cloning at least one proliferated cell to provide cloned T cells; and
- 5 (c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.
  - 42. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:
- 10 (a) contacting a biological sample obtained from a patient with a binding agent that binds to a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:
- (i) polynucleotides recited in any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536; and
  - (ii) complements of the foregoing polynucleotides;
  - (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and
  - (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.
    - 43. A method according to claim 42, wherein the binding agent is an antibody.
  - 44. A method according to claim 43, wherein the antibody is a monoclonal antibody.
- 45. A method according to claim 42, wherein the cancer is prostate 30 cancer.

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46. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

- (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;
- 10 (b) detecting in the sample an amount of polypeptide that binds to the binding agent;
  - (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.
  - 47. A method according to claim 46, wherein the binding agent is an antibody.
  - 48. A method according to claim 47, wherein the antibody is a monoclonal antibody.
- 49. A method according to claim 46, wherein the cancer is a prostate cancer.
  - 50. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:
- (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein,

wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;

- (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and
- (c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

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- 51. A method according to claim 50, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.
- 52. A method according to claim 50, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.
- 53. A method for monitoring the progression of a cancer in a patient, comprising the steps of:
  - (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence of any one of SEQ ID NO: 1-111, 115-171, 173-175, 177, 179-305, 307-315, 326, 328, 330, 332-335, 340-375, 381, 382 and 384-476, 524, 526, 530, 531, 533, 535 and 536, or a complement of any of the foregoing polynucleotides;
  - (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

- 54. A method according to claim 53, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.
- 55. A method according to claim 53, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.
  - 56. A diagnostic kit, comprising:
  - (a) one or more antibodies according to claim 11; and
  - (b) a detection reagent comprising a reporter group.
    - 57. A kit according to claim 56, wherein the antibodies are immobilized on a solid support.
- 20 58. A kit according to claim 56, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.
- 59. A kit according to claim 56, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups,
   enzymes, biotin and dye particles.
  - 60. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a prostate-specific protein, wherein the protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45,

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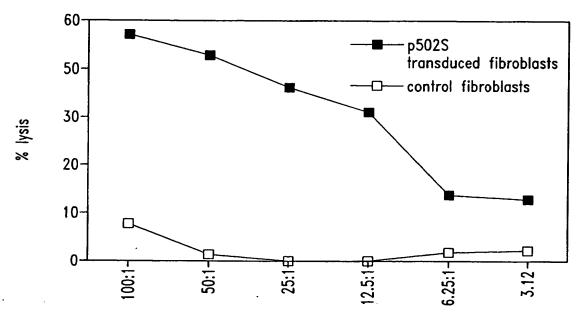
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61. A oligonucleotide according to claim 60, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 3, 8-29, 41-45, 47-52, 54-65, 70, 73-74, 79, 81, 87, 90, 92, 93, 97, 103, 104, 107, 109-111, 115-160, 171, 173-175, 177, 181, 188, 191, 193, 194, 198, 203, 204, 207, 209, 220, 222-225, 227-305, 307-315, 326, 328, 330, 332, 334, 350-365, 381, 382, 384, 386, 389, 390, 392, 393, 396, 401, 402, 407, 408, 410, 413, 415-419, 422, 426, 427, 432, 434, 435, 442-444, 446, 450, 452, 453, 459-461, 468-476, 524, 526, 530, 531, 533, 535 and 536.

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- 62. A diagnostic kit, comprising:
- (a) an oligonucleotide according to claim 61; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

- 63. A host cell according to claim 10, wherein the cell is selected from the group consisting of: *E. coli*, baculovirus and mammalian cells.
- 64. A recombinant protein produced by a host cell according to claim 25 10.



Effector: Target Ratio

Fig. 1

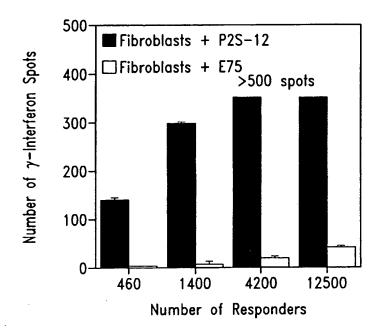


Fig. 2A

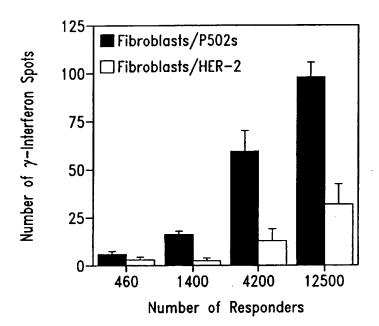


Fig. 2B

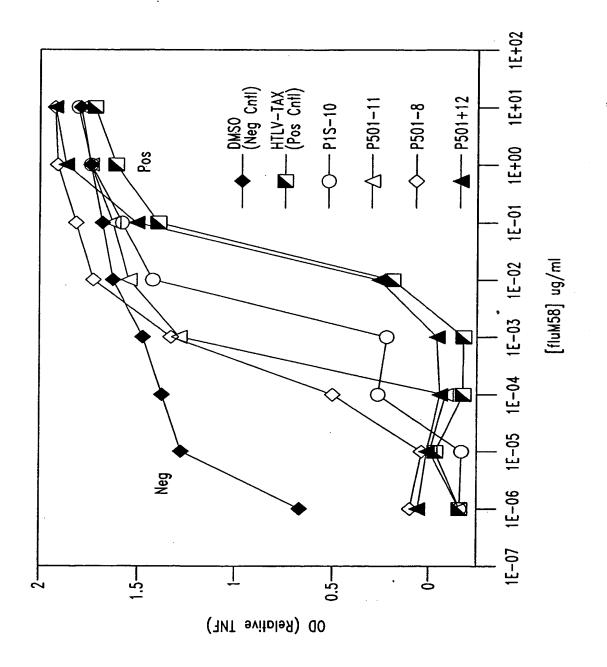


Fig. 3

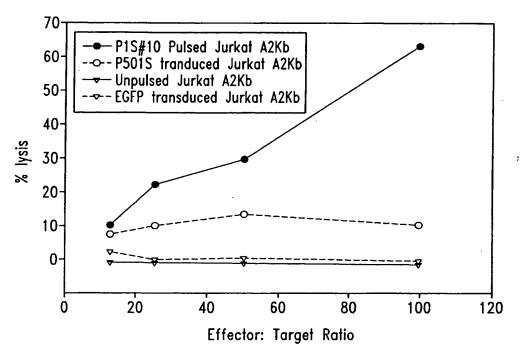


Fig. 4

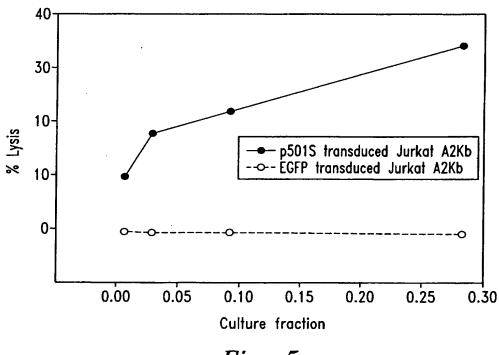
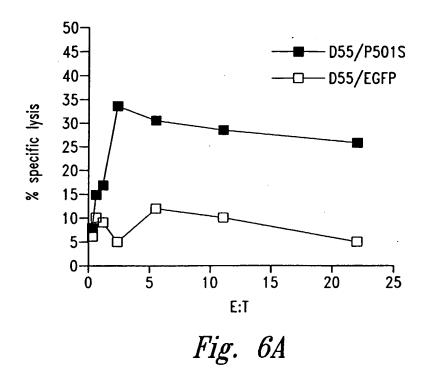
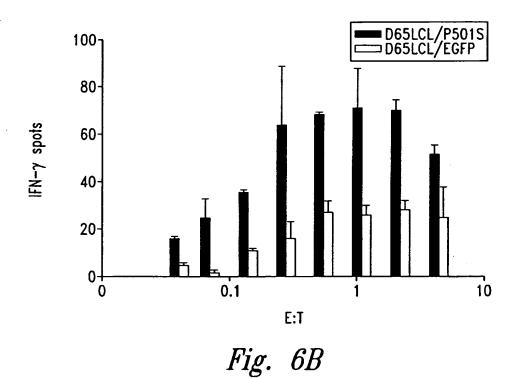
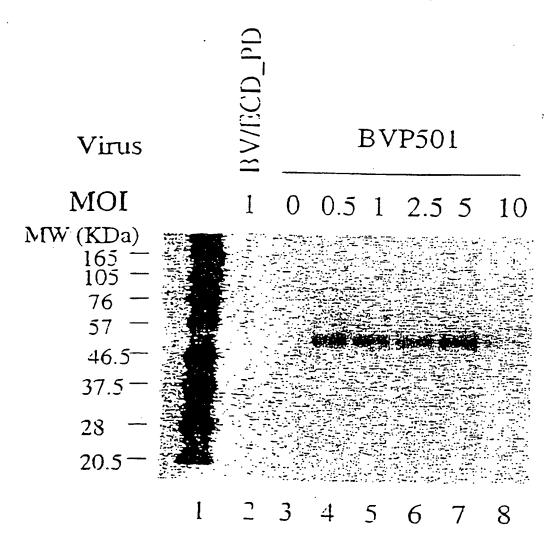


Fig. 5





## Expression of P501S by the Baculovirus Expression System



0.6 million high 5 rells in 6-well plate were infected with an unrelated control virus BV/ECD\_PD (lane 1), without virus (lane 3), or with recombinant baculovirus for P501 at different NOIs (lane 4 - 8). Cell lysates, were run on SDS-PAGE under the reducing conditions and analyzed by Western blot with a monoclonal antibody against 75 1.8 [75018-10E3-G4D3). Lane 1 is the biotinylated protein molecular weight marker. Stollabs).

Fig. 7

## Figure 8. Mapping of the epitope recognized by 10E3-G4-D3

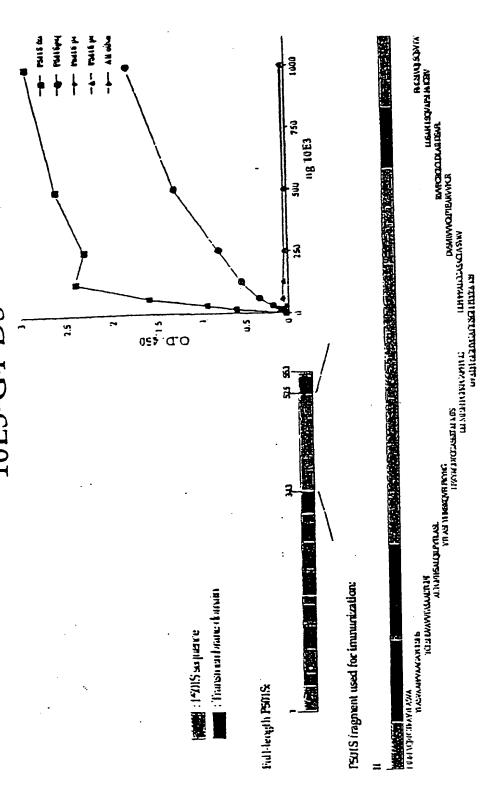


Fig. 8

## Schematic of P501S with predicted transmembrane, cytoplasmic, and extracellular regions

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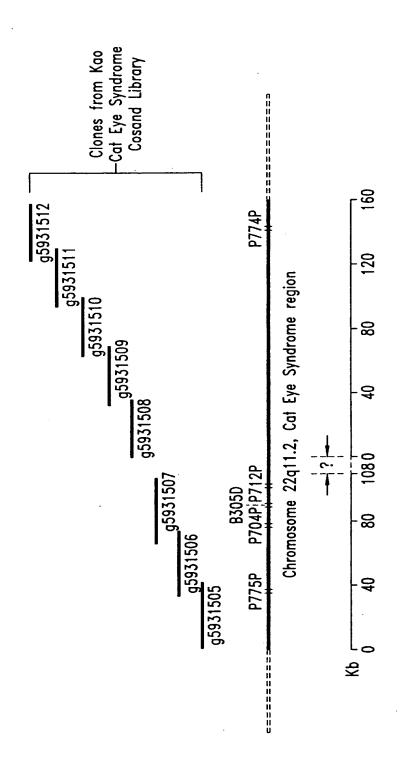
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<u>Underlined sequence</u>: Predicted transmembrane domain; **Bold sequence**: Predicted extracellular domain; *Italic sequence*: Predicted intracellular domain. Sequence in bold/underlined: used generate polyclonal rabbit serum

Localization of domains predicted using HMMTOP (G.E. Tusnady an I. Simon (1998) Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to topology Prediction.J.Mol Biol. 283, 489-506.

Fig. 9



9/10

Elisa assay of rabbit polyclonal antibody specificity

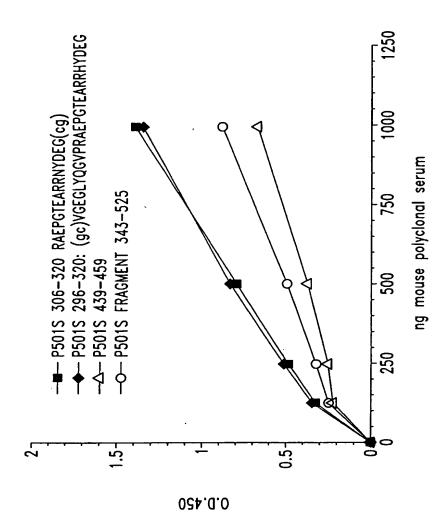


Fig. 11

## SEQUENCE LISTING

<110> Corixa Corporation Xu, Jiangchun Dillon, Davin C. Mitcham, Jennifer L. Harlocker, Susan Louise Jiang Yuqui Reed, Steven G. Kalos, Michael Fanger, Gary Retter, Mark Solk, John Day, Craig Skeiky, Yasir A.W. Wang, Aijun <120> COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF PROSTATE CANCER <130> 210121.42720PC <140> PCT <141> 2000-11-09 <160> 551 <170> FastSEQ for Windows Version 3.0 <210> 1 <211> 814 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> (1)...(814) <223> n = A,T,C or G<400> 1 ttttttttt ttttcacag tataacagct ctttatttct gtgagttcta ctaggaaatc 60 atcaaatctg agggttgtct ggaggacttc aatacacctc cccccatagt gaatcagctt 120 ccagggggtc cagtecetet cettaettea tecceatece atgccaaagg aagaceetee 180 ctccttggct cacagccttc tctaggcttc ccagtgcctc caggacagag tgggttatgt 240 tttcagctcc atccttgctg tgagtgtctg gtgcgttgtg cctccagctt ctgctcagtg 300 cttcatggac agtgtccagc acatgtcact ctccactctc tcagtgtgga tccactagtt 360 ctagagcggc cgccaccgcg gtggagctcc agcttttgtt ccctttagtg agggttaatt 420 gcgcgcttgg cgtaatcatg gtcataactg tttcctgtgt gaaattgtta tccgctcaca 480 attccacaca acatacgage eggaageata aagtgtaaag eetggggtge etaatgagtg 540 anctaactca cattaattgc gttgcgctca ctgnccgctt tccagtcngg aaaactgtcg 600 tgccagctgc attaatgaat cggccaacgc ncggggaaaa gcggtttgcg ttttgggggc 660 tetteegett etegeteact nanteetgeg eteggtentt eggetgeggg gaaeggtate 720 actcctcaaa ggnggtatta cggttatccn naaatcnggg gatacccngg aaaaaanttt 780 aacaaaaggg cancaaaggg cngaaacgta aaaa 814 <210> 2 <211> 816

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 gtgageteag gtgattgata eteetgatge gagtaataeg gatgtgttta ggagtgggae
                                                                         420
 ttctagggga tttagcgggg tgatgcctgt tgggggccag tgccctccta gttggggggt
                                                                         480
 aggggctagg ctggagtggt aaaaggctca gaaaaatcct gcgaagaaaa aaacttctga
                                                                         540
 ggtaataaat aggattatcc cgtatcgaag gcctttttgg acaggtggtg tgtggtggcc
                                                                         600
 ttggtatgtg ctttctcgtg ttacatcgcg ccatcattgg tatatggtta gtgtgttggg
                                                                         660
 ttantanggc ctantatgaa gaacttttgg antggaatta aatcaatngc ttggccggaa
                                                                         720
 gtcattanga nggctnaaaa ggccctgtta ngggtctggg ctnggtttta cccnacccat
                                                                         780
 ggaatnenee eeeeggaena ntgnateeet attettaa
                                                                         818
       <210> 7
       <211> 817
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(817)
       \langle 223 \rangle n = A,T,C or G
       <400> 7
 ttttttttt tttttttt tggctctaga gggggtagag ggggtgctat agggtaaata
                                                                         60
 cgggccctat ttcaaagatt tttaggggaa ttaattctag gacgatgggt atgaaactgt
                                                                        120
 ggtttgctcc acagatttca gagcattgac cgtagtatac ccccggtcgt gtagcggtga
                                                                        180
 aagtggtttg gtttagacgt ccgggaattg catctgtttt taagcctaat gtggggacag
                                                                        240
 ctcatgagtg caagacgtct tgtgatgtaa ttattatacn aatgggggct tcaatcggga
                                                                        300
gtactactcg attgtcaacg tcaaggagtc gcaggtcgcc tggttctagg aataatgggg
                                                                        360
gaagtatgta ggaattgaag attaatccgc cgtagtcggt gttctcctag gttcaatacc
                                                                        420
attggtggcc aattgatttg atggtaaggg gagggatcgt tgaactcgtc tgttatgtaa
                                                                        480
aggatneett ngggatggga aggenatnaa ggaetangga tnaatggegg geangatatt
                                                                        540
tcaaacngtc tctanttcct gaaacgtctg aaatgttaat aanaattaan tttngttatt
                                                                        600
gaatnttnng gaaaagggct tacaggacta gaaaccaaat angaaaanta atnntaangg
                                                                        660
enttatentn aaaggtnata aceneteeta tnateeeace caatngnatt eeceaenenn
                                                                        720
acnattggat necesantts canaaangge encessegg tgnannesne ettttgtts
                                                                        780
cttnantgan ggttattene ecetngentt atcance
                                                                        817
      <210> 8
      <211> 799
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(799)
      <223> n = A,T,C or G
      <400> 8
catttccggg tttactttct aaggaaagcc gagcggaagc tgctaacgtg ggaatcggtg
                                                                        60
cataaggaga actttctgct ggcacgcgct agggacaagc gggagagcga ctccgagcgt
                                                                       120
ctgaagcgca cgtcccagaa ggtggacttg gcactgaaac agctgggaca catccgcgag
                                                                       180
tacgaacage geetgaaagt getggagegg gaggtecage agtgtageeg egteetgggg
                                                                       240
tgggtggccg angectgane egetetgeet tgetgeeece angtgggccg ecacecetg
                                                                       300
acctgcctgg gtccaaacac tgagccctgc tggcggactt caagganaac ccccacangg
                                                                       360
ggattttgct cctanantaa ggctcatctg ggcctcggcc ccccacctg gttggccttg
                                                                       420
tetttgangt gageeceatg tecatetggg ceaetgteng gaceacettt ngggagtgtt
                                                                       480
ctccttacaa ccacannatg cccggctcct cccggaaacc antcccancc tgngaaggat
                                                                       540
caagneetgn atceactnnt netanaaceg geeneeneeg engtggaace encettntgt
                                                                       600
teettttent tnagggttaa tnnegeettg geettneean ngteetnene ntttteennt
                                                                       660
```

```
gttnaaattg ttangeneec neennteeen ennennenan eeegaeeenn annttnnann
                                                                       720
nectgggggt necnnengat tgacconnec necetntant tgenttnggg nnenntgece
                                                                       780
                                                                       799
ctttccctct nggganncg
      <210> 9
      <211> 801
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(801)
      <223> n = A, T, C or G
      <400> 9
                                                                        60
acgcettgat ceteccagge tgggaetggt tetgggagga geegggeatg etgtggtttg
taangatgac actcccaaag gtggtcctga cagtggccca gatggacatg gggctcacct
                                                                       120
caaggacaag gccaccaggt gcgggggccg aagcccacat gatccttact ctatgagcaa
                                                                       180
aatcccctgt gggggcttct ccttgaagtc cgccancagg gctcagtctt tggacccang
                                                                       240
caggicatgg ggitgingne caactggggg cencaaegea aaanggenea gggeetengn
                                                                       300
cacccatece angaegegge tacactnetg gacetecene tecaccaett teatgegetg
                                                                       360
ttentaceeg egnatntgte ceanctgttt engtgeenae tecanettet nggaegtgeg
                                                                       420
ctacatacge ceggantene netecegett tgtecetate caegtneean caacaaattt
                                                                       480
encentanty cacenattee caenttine agnitteene nnegngette etintaaaag
                                                                       540
                                                                       600
ggttganccc cggaaaatnc cccaaagggg gggggccngg tacccaactn ccccctnata
getgaantce ceatnacenn gnetenatgg ancenteent tttaannach ttetnaactt
                                                                       660
gggaanance etegneentn ecceenttaa teceneettg enangment ecceenntee
                                                                       720
necennntng gentntnann enaaaaagge cennnancaa teteetnnen eeteantteg
                                                                       780
                                                                       801
ccancecteg aaateggeen c
      <210> 10
      <211> 789
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(789)
      \langle 223 \rangle n = A,T,C or G
      <400> 10
                                                                        60
cagtetaint ggccagtgtg gcagetttee etgtggetge eggtgecaea tgeetgteee
acagtgtggc cgtggtgaca gcttcagccg ccctcaccgg gttcaccttc tcagccctgc
                                                                        120
agatectgee ctacacactg geetecetet accaceggga gaageaggtg tteetgeeea
                                                                        180
aataccgagg ggacactgga ggtgctagca gtgaggacag cctgatgacc agcttcctgc
                                                                        240
                                                                        300
caggccctaa gcctggagct cccttcccta atggacacgt gggtgctgga ggcagtggcc
tgctcccacc tccacccgcg ctctgcgggg cctctgcctg tgatgtctcc gtacgtgtgg
                                                                        360
tggtgggtga gcccaccgan gccagggtgg ttccgggccg gggcatctgc ctggacctcg
                                                                        420
ccatcctgga tagtgcttcc tgctgtccca ngtggcccca tccctgttta tgggctccat
                                                                        480
tgtccagete agecagtetg teactgeeta tatggtgtet geegeaggee tgggtetggt
                                                                       540
cccatttact ttgctacaca ggtantattt gacaagaacg anttggccaa atactcagcg
                                                                       600
ttaaaaaatt ccagcaacat tgggggtgga aggcctgcct cactgggtcc aactccccgc
                                                                       660
tcctgttaac cccatggggc tgccggcttg gccgccaatt tctgttgctg ccaaantnat
                                                                       720
gtggctctct gctgccacct gttgctggct gaagtgcnta cngcncanct nggggggtng
                                                                       780
                                                                        789
ggngttccc
```

<210> 11 <211> 772

```
<212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(772)
      \langle 223 \rangle n = A,T,C or G
      <400> 11
cccaccctac ccaaatatta gacaccaaca cagaaaagct agcaatggat tcccttctac
                                                                         60
tttgttaaat aaataagtta aatatttaaa tgcctgtgtc tctgtgatgg caacagaagg
                                                                        120
accaacaggc cacatcctga taaaaggtaa gagggggtg gatcagcaaa aagacagtgc
                                                                        180
tgtgggctga ggggacctgg ttcttgtgtg ttgcccctca ggactcttcc cctacaaata
                                                                        240
actttcatat gttcaaatcc catggaggag tgtttcatcc tagaaactcc catgcaagag
                                                                        300
ctacattaaa cgaagctgca ggttaagggg cttanagatg ggaaaccagg tgactgagtt
                                                                        360
tatteagete ecaaaaacee ttetetaggt gtgteteaac taggaggeta getgttaace
                                                                        420
ctgagectgg gtaatecace tgeagagtee eegcatteea gtgeatggaa eeettetgge
                                                                        480
ctccctgtat aagtccagac tgaaaccccc ttggaaggnc tccagtcagg cagccctana
                                                                        540
aactggggaa aaaagaaaag gacgcccan cccccagetg tgcanctacg cacctcaaca
                                                                        600
gcacagggtg gcagcaaaaa aaccacttta ctttggcaca aacaaaact ngggggggca
                                                                        660
accccggcac cccnangggg gttaacagga ancngggnaa cntggaaccc aattnaggca
                                                                        720
ggcccnccac cccnaatntt gctgggaaat ttttcctccc ctaaattntt tc
                                                                        772
      <210> 12
      <211> 751
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (751)
      <223> n = A, T, C or G
      <400> 12
gccccaattc cagctgccac accacccacg gtgactgcat tagttcggat gtcatacaaa
                                                                         60
agetgattga ageaaccete tactttttgg tegtgageet tttgettggt geaggtttea
                                                                        120
ttggctgtgt tggtgacgtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                        180 .
aagtanggtg agtcctcaaa atccgtatag ttggtgaagc cacagcactt gagccctttc
                                                                        240
atggtggtgt tccacacttg agtgaagtct tcctgggaac cataatcttt cttgatggca
                                                                        300
ggcactacca gcaacgtcag ggaagtgctc agccattgtg gtgtacacca aggcgaccac
                                                                        360
agcagetgen aceteageaa tgaagatgan gaggangatg aagaagaacg tenegaggge
                                                                        420
acacttgctc tcagtcttan caccatanca gcccntgaaa accaananca aagaccacna
                                                                        480
cnccggctgc gatgaagaaa tnaccccncg ttgacaaact tgcatggcac tggganccac
                                                                        540
agtggcccna aaaatcttca aaaaggatgc cccatcnatt gaccccccaa atgcccactg
                                                                        600
ccaacagggg ctgccccacn cncnnaacga tganccnatt gnacaagatc tncntggtct
                                                                        660
tnatnaacht gaaccetgen tngtggetee tgtteaggne ennggeetga ettetnaann
                                                                        720
aangaacton gaagnoocca enggananno g
                                                                        751
      <210> 13
      <211> 729
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(729)
      \langle 223 \rangle n = A,T,C or G
```

```
<400> 13
gagecaggeg tecetetgee tgeccaetea gtggcaacae eegggagetg ttttgteett
                                                                         60
tgtggancct cagcagtncc ctctttcaga actcantgcc aaganccctg aacaggagcc
                                                                        120
accatgcagt gcttcagctt cattaagacc atgatgatcc tcttcaattt gctcatcttt
                                                                        180
ctgtgtggtg cagccctgtt ggcagtgggc atctgggtgt caatcgatgg ggcatccttt
                                                                        240
ctgaagatct tegggecact gtegtecagt gecatgeagt ttgteaacgt gggetactte
                                                                        300
ctcatcgcag ccggcgttgt ggtcttagct ctaggtttcc tgggctgcta tggtgctaag
                                                                        360
actgagagca agtgtgccct cgtgacgttc ttcttcatcc tcctcctcat cttcattgct
                                                                        420
gaggttgcaa tgctgtggtc gccttggtgt acaccacaat ggctgagcac ttcctgacgt
                                                                        480
tgctggtaat gcctgccatc aanaaaagat tatgggttcc caggaanact tcactcaagt
                                                                        540
gttggaacac caccatgaaa gggctcaagt gctgtggctt cnnccaacta tacggatttt
                                                                        600
gaagantcac ctacttcaaa gaaaanagtg cctttccccc atttctgttg caattgacaa
                                                                       : 660
acgtccccaa cacagccaat tgaaaacctg cacccaaccc aaangggtcc ccaaccanaa
                                                                        720
attnaaggg
                                                                        729
      <210> 14
      <211> 816
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (816)
      \langle 223 \rangle n = A,T,C or G
      <400> 14
tgctcttcct caaagttgtt cttgttgcca taacaaccac cataggtaaa gcgggcgcag
                                                                         60
tgttcgctga aggggttgta gtaccagcgc gggatgctct ccttgcagag tcctgtgtct
                                                                        120
ggcaggtcca cgcagtgccc tttgtcactg gggaaatgga tgcgctggag ctcgtcaaag
                                                                        180
ccactcgtgt atttttcaca ggcagcctcg tccgacgcgt cggggcagtt gggggtgtct
                                                                        240
tcacactcca ggaaactgtc natgcagcag ccattgctgc agcggaactg ggtgggctga
                                                                        300
cangtgccag agcacactgg atggcgcctt tccatgnnan gggccctgng ggaaagtccc
                                                                        360
tganceccan anetgeetet caaangeece acettgeaca eecegacagg etagaatgga
                                                                        420
atettettee egaaaggtag tinttetigt igeceaanee aneecentaa acaaacteti
                                                                        480
gcanatetge teegnggggg tentantace anegtgggaa aagaaceeca ggengegaac
                                                                        540
caancttgtt tggatnegaa genataatet netnttetge ttggtggaca qeaccantna
                                                                        600
etgtnnanet ttagneentg gteetentgg gttgnnettg aacetaaten cennteaact
                                                                        660
gggacaaggt aantngccnt cetttnaatt ecenanentn eeeeetggtt tggggttttn
                                                                        720
cnenetecta ecceagaaan neegtgttee ecceeaaeta ggggeenaaa eennttntte
                                                                        780
cacaaccctn ccccacccac gggttcngnt ggttng
                                                                        816
      <210> 15
      <211> 783
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(783)
      \langle 223 \rangle n = A,T,C or G
      <400> 15
ccaaggcctg ggcaggcata nacttgaagg tacaacccca ggaacccctg gtgctgaagg
                                                                         60
atgtggaaaa cacagattgg cgcctactgc ggggtgacac ggatgtcagg gtagagagga
                                                                        120
                                                                        180
aagacccaaa ccaggtggaa ctgtggggac tcaaggaang cacctacctg ttccagctga
                                                                        240
cagtgactag ctcagaccac ccagaggaca cggccaacgt cacagtcact gtgctgtcca
ccaagcagac agaagactac tgcctcgcat ccaacaangt gggtcgctgc cggggctctt
                                                                        300
teccaegetg gtactatgae eccaeggage agatetgeaa gagtttegtt tatggagget
                                                                        360
```

```
gettgggcaa caagaacaac tacettcggg aagaagagtg cattetance tgtengggtg
                                                                        420
tgcaaggtgg gcctttgana ngcanctctg gggctcangc gactttcccc cagggcccct
                                                                        480
ccatggaaag gcgccatcca ntgttctctg gcacctgtca gcccacccag ttccgctgca
                                                                        540
                                                                        600
ncaatggctg ctgcatcnac antttcctng aattgtgaca acaccccca ntgcccccaa
                                                                        660
ccctcccaac aaagcttccc tgttnaaaaa tacnccantt ggcttttnac aaacncccgg
                                                                        720
cncctccntt ttccccnntn aacaaagggc nctngcnttt gaactgcccn aacccnggaa
tetneenngg aaaaantnee eeceetggtt eetnnaance eeteenenaa anetneeeee
                                                                        780
                                                                        783
      <210> 16
      <211> 801
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(801)
      \langle 223 \rangle n = A,T,C or G
      <400> 16
gccccaattc cagctgccac accacccacg gtgactgcat tagttcggat gtcatacaaa
                                                                         60
                                                                        120
agetgattga ageaaccete taetttttgg tegtgageet tttgettggt geaggtttea
ttggctgtgt tggtgacgtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                        180
                                                                        240
aagtagggtg agtcctcaaa atccgtatag ttggtgaagc cacagcactt gagccctttc
atggtggtgt tecacacttg agtgaagtet teetgggaac cataatettt ettgatggca
                                                                        300
ggcactacca gcaacgtcag gaagtgctca gccattgtgg tgtacaccaa ggcgaccaca
                                                                        360
gcagctgcaà cctcagcaat gaagatgagg aggaggatga agaagaacgt cncgagggca
                                                                        420
cacttgctct ccgtcttagc accatagcag cccangaaac caagagcaaa gaccacaacg
                                                                        480
congetgoga atgaaagaaa ntacccacgt tgacaaactg catggccact ggacgacagt
                                                                        540 ·
                                                                        600
tggcccgaan atcttcagaa aagggatgcc ccatcgattg aacacccana tgcccactgc
                                                                        660
cnacaggget geneenenen gaaagaatga gecattgaag aaggatente ntggtettaa
tgaactgaaa centgeatgg tggeeeetgt teagggetet tggeagtgaa ttetganaaa
                                                                        720
                                                                        780
aaggaacngc ntnagccccc ccaaangana aaacaccccc gggtgttgcc ctgaattggc
                                                                        801
ggccaaggan ccctgccccn g
      <210> 17
      <211> 740
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(740)
      <223> n = A, T, C or G
      <400> 17
                                                                         60
gtgagageca ggegteeete tgeetgeeea eteagtggea acaeeeggga getgttttgt
cctttgtgga gcctcagcag ttccctcttt cagaactcac tgccaagagc cctgaacagg
                                                                        120
agccaccatg cagtgettca getteattaa gaccatgatg atcetettca atttgeteat
                                                                        180
                                                                        240
ctttctgtgt ggtgcagccc tgttggcagt gggcatctgg gtgtcaatcg atggggcatc
etttetgaag atetteggge caetgtegte cagtgccatg cagtttgtca acgtgggeta
                                                                        300
ettecteate geageeggeg ttgtggtett tgetettggt tteetggget getatggtge
                                                                        360
                                                                        420
taagacggag agcaagtgtg ccctcgtgac gttcttcttc atcctcctcc tcatcttcat
tgctgaagtt gcagctgctg tggtcgcctt ggtgtacacc acaatggctg aaccattcct
                                                                        480
                                                                        540
gacgttgctg gtantgcctg ccatcaanaa agattatggg ttcccaggaa aaattcactc
                                                                       600
aantntggaa caccnccatg aaaagggete caatttetgn tggetteece aactataceg
                                                                       660
gaattttgaa aganteneee taetteeaaa aaaaaanant tgeetttnee eeenttetgt
                                                                       720
tgcaatgaaa acntcccaan acngccaatn aaaacctgcc cnnncaaaaa ggntcncaaa
```

```
caaaaaant nnaagggttn
                                                                         740
       <210> 18
       <211> 802
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(802)
       \langle 223 \rangle n = A,T,C or G
       <400> 18
ccgctggttg cgctggtcca gngnagccac gaagcacgtc agcatacaca gcctcaatca
                                                                         60
caaggtette cagetgeege acattaegea gggeaagage etecageaae actgeatatg
                                                                        120
ggatacactt tactttagca gccagggtga caactgagag gtgtcgaagc ttattcttct
                                                                        180
gagcctctgt tagtggagga agattccggg cttcagctaa gtagtcagcg tatgtcccat
                                                                        240
aagcaaacac tgtgagcagc cggaaggtag aggcaaagtc actctcagcc agctctctaa
                                                                        300
cattgggcat gtccagcagt tctccaaaca cgtagacacc agnggcctcc agcacctgat
                                                                        360
ggatgagtgt ggccagcgct gcccccttgg ccgacttggc taggagcaga aattgctcct
                                                                        420
ggttctgccc tgtcaccttc acttccgcac tcatcactgc actgagtgtg ggggacttgg
                                                                        480
getcaggatg tecagagaeg tggtteegee ecetenetta atgacacegn ceanneaace
                                                                        540
gtcggctccc gccgantgng ttcgtcgtnc ctgggtcagg gtctgctggc cnctacttgc
                                                                        600
aancttegte nggeecatgg aatteacene aceggaaetn gtangateea etnnttetat
                                                                        660
aaccggncgc caccgcnnnt ggaactccac tcttnttncc tttacttgag ggttaaggtc
                                                                        720
accettnneg ttacettggt ccaaacentn centgtgteg anatngtnaa tenggneena
                                                                        780
tnccancene atangaagee ng
                                                                        802
      <210> 19
      <211> 731.
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(731)
      <223> n = A, T, C or G
      <400> 19
cnaagettee aggtnaeggg eegenaance tgaeeenagg tancanaang eagnengegg
                                                                         60
gageceaceg teacgnggng gngtetttat nggaggggge ggagecacat enetggaent
                                                                        120
cntgacccca actccccncc ncncantgca gtgatgagtg cagaactgaa ggtnacgtgg
                                                                        180
caggaaccaa gancaaanne tgeteennte caagteggen nagggggegg ggetggecae
                                                                        240
geneateent enagtgetgn aaageeeenn eetgtetaet tgtttggaga aengennnga
                                                                        300
catgcccagn gttanataac nggcngagag tnantttgcc tctcccttcc ggctgcgcan
                                                                        360
cgngtntgct tagnggacat aacctgacta cttaactgaa cccnngaatc tnccnccct
                                                                        420
ccactaagct cagaacaaaa aacttcgaca ccactcantt gtcacctgnc tgctcaagta
                                                                        480
aagtgtaccc catneccaat gtntgctnga ngetetgnee tgenttangt teggteetgg
                                                                        540
gaagacctat caattnaagc tatgtttctg actgcctctt gctccctgna acaancnacc
                                                                        600
cnncnntcca aggggggnc ggccccaat cccccaacc ntnaattnan tttancccn
                                                                       660
ecceenggee eggeetttta enanentenn nnaengggna aaacennnge tttneecaae
                                                                       720
nnaatccncc t
                                                                       731
      <210> 20
      <211> 754
      <212> DNA
      <213> Homo sapien
```

```
<220>
      <221> misc_feature
      <222> (1)...(754)
      <223> n = A, T, C or G
      <400> 20
ttttttttt tttttttt taaaaacccc ctccattnaa tgnaaacttc cgaaattgtc
                                                                        60
caacccctc ntccaaatnn contttccgg gngggggttc caaacccaan ttanntttgg
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annttaaatt aaatnttnnt tggnggnnna anccnaatgt nangaaagtt naacccanta
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tnancttnaa tncctggaaa congtngntt ccaaaaatnt ttaaccctta antccctccg
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aaatngttna nggaaaaccc aanttctcnt aaggttgttt gaaggntnaa tnaaaanccc
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nnccaattgt ttttngccac gcctgaatta attggnttcc gntgttttcc nttaaaanaa
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ggnnancccc ggttantnaa tccccccnnc cccaattata ccganttttt ttngaattgg
                                                                        420
ganccenegg gaattaaegg ggnnnnteee tnttgggggg enggnneeee eccenteggg
                                                                        480
ggttngggnc aggnennaat tgtttaaggg teegaaaaat eeeteenaga aaaaaanete
                                                                       540
ccaggntgag nntngggttt necececee canggeeeet etegnanagt tggggtttgg
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ggggcctggg attttntttc ccctnttncc tcccccccc ccnggganag aggttngngt
                                                                        660
tttgntcnnc ggccccnccn aaganctttn ccganttnan ttaaatccnt gcctnggcga
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                                                                       754
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      <211> 755
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature.
      <222> (1)...(755)
      <223> n = A,T,C or G
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nncanatncc actganngcg cgangtngan ngagaaanct nataccanag ncaccanacn
                                                                       180
ccagctgtcc nanaangcct nnnatacngg nnnatccaat ntgnancctc cnaagtattn
                                                                       240
                                                                       300
nncnncanat gattttcctn ancegattac centnecece tancecetee ceeccaacna
cgaaggenet ggneenaagg nngegnenee eegetagnte eeenneaagt eneneneeta
                                                                       360 ·
aactcancen nattacnege ttentgagta teacteceeg aateteacee tactcaacte
                                                                       420
aaaaanatcn gatacaaaat aatncaagcc tgnttatnac actntgactg ggtctctatt
                                                                       480
ttagnggtcc ntnaanchtc ctaatacttc cagtctncct tenccaattt cenaanggct
                                                                       540
ctttcngaca gcatnttttg gttcccnntt gggttcttan ngaattgccc ttcntngaac
                                                                       600
gggetentet ttteettegg ttancetggn ttenneegge cagttattat tteeentttt
                                                                       660
aaattentne entttanttt tggenttena aacceegge ettgaaaacg geeceetggt
                                                                       720
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                                                                       755
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      <211> 849
      <212> DNA
      <213> Homo sapien
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      <221> misc_feature
      <222> (1)...(849)
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atcetgnnna eggaanggte aceggnngat nntgetaggg tgneenetee cannnenttn cataacteng nggeeetgee caccacette ggeggeeeng ngneegggee egggteattn gnnttaacen caetnngena neggttteen neecenneng aceenggega teeggggtne tetgtettee eetgnagnen anaaantggg eeneggneee etttaceeet nnacaageea	180 240 300 360
engeenteta neenengeee eeeteeant nngggggaet geenannget eegttnetng nnaeeeennn gggtneeteg gttgtegant enaeegnang eeanggatte enaaggaagg tgegttnttg geeeetaeee ttegetnegg nneaeeetté eegaenanga neegeteeeg enennegnng eeteneeteg eaacaeeege netentengt neggnnneee eeeeaeeege	420 480 540 600
necetenene ngnegnanen eteeneenee gteteannea eeaeeeegee eegeeaggee nteaneeaen ggnngaenng nagenennte geneegegen gegneneeet egeenengaa etnentengg eeantnnege teaaneenna enaaaegeeg etgegeggee egnagegnee neeteenega gteeteeegn etteenaeee angnntteen egaggaeaen nnaeeeegee	660 720 780 840
nncangegg  <210> 23 <211> 872 <212> DNA	849
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cacachenan aganaaatee netgeettee anagtanaen attgaaching agaaceange	180
nggcgaatcg taatnaggcg tgcgccgcca atntgtcncc gtttattntn ccagcntcnc ctnccnaccc tacntcttcn nagctgtcnn acccctngtn cgnacccccc naggtcggga	240
tegggtttnn nntgacegng enneceetee eccentecat nacganeene eegcaceace	300 360
nanngenege neecegnnet ettegeenee etgteetntn eecetgtnge etggenengn	420
accigcattga ccctcgccnn ctncnngaaa ncgnanacgt ccgggttgnn annancgctg	480
tgggnnngcg tctgcnccgc gttccttccn ncnncttcca ccatcttcnt tacngggtct	540
consecute tennaceur coteggacge thteethtge coccetthae teccecett	600
cgncgtgncc cgnccccacc ntcatttnca nacgntcttc acaannncct ggntnnctcc	660
cnancngnen gteaneenag ggaagggngg ggnneenntg nttgaegttg nggngangte	720
cgaanantcc tencentean enetaceeet egggegnnet etengttnee aacttaneaa	780
ntetecceeg ngngemente teagectene ceneceenet etetgeantg tnetetgete tnacenntae gantnttegn enceetett ee	840
	872
<210> 24	
<211> 815	
<212> DNA	
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<222> (1)(815)	
<223> n = A,T,C or G	
<400> 24	
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tentneatta gtaacaantg tnntgtecat eetgtengan canattecca tnnattnegn	180
cgcattenen geneantatn taatngggaa ntennntnnn neacenneat etatentnee	240
geneeetgae tggnagagat ggatnantte tnntntgace nacatgttea tettggattn	300
aanancecee egengneeae eggttngnng enageennte eeaagacete etgtggaggt	360

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420
aacctgcqtc aganncatca aacntgggaa acccgcnncc angtnnaagt ngnnncanan
qatcccgtcc aggnttnacc atcccttcnc agcgcccct ttngtgcctt anagngnagc
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gtgtccnanc enctcaacat ganacgegee agneeanceg caattnggea caatgtegne
                                                                        540.
                                                                        600
qaacccccta gggggantna tncaaanccc caggattgtc cncncangaa atcccncanc
cccnccctac ccnnctttgg gacngtgacc aantcccgga gtnccagtcc ggccngnctc
                                                                        660
                                                                        720
ccccaccggt nnccntgggg gggtgaanct cngnntcanc cngncgaggn ntcgnaagga
                                                                        780
accggneetn ggnegaanng anenntenga agngeenent egtataacce ecceteneca
                                                                        815
nccnacngnt agntcccccc engggtnegg aangg
      <210> 25
      <211> 775
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(775)
      <223> n = A, T, C \text{ or } G
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                                                                         60
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                                                                        120
agtcaaattt cctgaattgc tatgtgtctg ggtttcatcc atccgacatt gaanttgact
                                                                        180
tactgaagaa tgganagaga attgaaaaag tggagcattc agacttgtct ttcagcaagg
                                                                        240
actggtcttt ctatctcntg tactacactg aattcacccc cactgaaaaa gatgagtatg
                                                                        300
cctgccgtgt gaaccatgtg actttgtcac agcccaagat agttaagtgg gatcgagaca
                                                                        360
tgtaagcagn cnncatggaa gtttgaagat gccgcatttg gattggatga attccaaatt
                                                                        420
                                                                        480
ctgcttgctt gcnttttaat antgatatgc ntatacaccc taccctttat gnccccaaat
tgtaggggtt acatnantgt tcncntngga catgatcttc ctttataant ccnccnttcg
                                                                        540
aattgcccgt cncccngttn ngaatgtttc cnnaaccacg gttggctccc ccaggtcncc
                                                                        600
tettaeggaa gggeetggge enetttneaa ggttggggga acenaaaatt tenettntge
                                                                        660
conceneca enntettgng nnencanttt ggaaceette enatteeeet tggeetenna
                                                                        720
neettnneta anaaaaettn aaanegtnge naaanntttn aetteeeee ttaee
                                                                        775
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      <211> 820
      <212> DNA
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      <220>
      <221> misc_feature
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      \langle 223 \rangle n = A,T,C or G
      <400> 26
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                                                                        120
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                                                                        180
gaaaaggtgg cggtccccat cactcctcct ctcccatagc catcccagag gggtgagtag
                                                                        240
ccatcangcc ttcggtggga gggagtcang gaaacaacan accacagagc anacagacca
                                                                        300
ntgatgacca tgggcgggag cgagcctctt ccctgnaccg gggtggcana nganagccta
nctgaggggt cacactataa acgttaacga ccnagatnan cacctgcttc aagtgcaccc
                                                                        360
                                                                        420
tteetacetg aenaceagng acennnaaet gengeetggg gaeagenetg gganeageta
                                                                        480
acnnageact cacetgeece eccatggeeg tnegenteec tggteetgne aagggaaget
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ccctgttgga attncgggga naccaaggga nccccctcct ccanctgtga aggaaaaann
                                                                        600
gatggaattt tnecetteeg geennteece tetteettta caegeeceet nntaetente
tecetetntt nteetgnene aettttnace cennnattte cettnattga teggannetn
                                                                        660
                                                                        720
ganattccac tnncgcctnc cntcnatcng naanacnaaa nactntctna cccnggggat
                                                                        780
gggnncctcg ntcatcctct ctttttcnct accnccnntt ctttgcctct ccttngatca
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tecaacente gntggeentn ecceccennn teetttneee
                                                                        820
       <210> 27
       <211> 818
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(818)
       <223> n = A, T, C or G
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tgtttcttct ccgagcccca ggcagcggtg attcagccct gcccaacctg attctgatga
                                                                        120
ctgcggatgc tgtgacggac ccaaggggca aatagggtcc cagggtccag ggaggggcgc
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ctgctgagca cttccgcccc tcaccctgcc cagcccctgc catgagctct gggctgggtc
                                                                        240
tecgeeteca gggttetget ettecangea ngeeancaag tggegetggg ceacactgge
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ttetteetge ecenteeetg getetgante tetgtettee tgteetgtge angeneettg
                                                                        360
gatctcagtt tecetenete anngaactet gtttetgann tetteantta actntgantt
                                                                        420
tatnaccnan tggnetgtne tgtennactt taatgggeen gaecggetaa teeeteeete
                                                                        480
netecettee anttennnna acengettne ententetee centaneeeg cengggaane
                                                                        540
ctcctttgcc ctnaccangg gccnnnaccg cccntnnctn ggggggcnng gtnnctncnc
                                                                        600
etqntnncce enetenennt theetegtee ennennegen nngcanntte nengteeenn
                                                                        660
tnnctcttcn ngtntcgnaa ngntcncntn tnnnnngncn ngntnntncn tccctctcnc
                                                                        720
cnnntgnang tnnttnnnnc ncngnncccc nnnncnnnnn nggnnntnnn tctncncngc
                                                                        780
cccnnccccc ngnattaagg cctccnntct ccqqccnc
                                                                        818
      <210> 28
      <211> 731
      <212> DNA
      <213 * Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (731)
      <223> n = A, T, C or G
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                                                                       120
gattnaaccc cattgtatgg agnnaaaggn tttnagggat ttttcggctc ttatcagtat
                                                                       180
ntanattcct gtnaatcgga aaatnatntt tcnncnggaa aatnttgctc ccatccgnaa
                                                                       240
attnctcccg ggtagtgcat nttngggggn cngccangtt tcccaggctg ctanaatcgt
                                                                       300
actaaagntt naagtgggan tncaaatgaa aacctnncac agagnatccn tacccgactg
                                                                       360
tnnnttncct tegecetntg actetgenng ageceaatae cenngngnat gtenecengn
                                                                       420
nnngegnene tgaaannnne tegnggetnn gancateang gggtttegea teaaaagenn
                                                                       480
cgtttcncat naaggcactt tngcctcatc caaccnctng ccctcnncca tttngccgtc
                                                                       540
nggttenect aegetnntng encetnnntn ganattitne eegeetnggg naanceteet
                                                                       600
gnaatgggta gggnettnte ttttnacenn gnggtntact aatennetne acgentnett
                                                                       660
tetenacece ecceetttt caateceane ggenaatggg gteteecenn eganggggg
                                                                       720
nnncccannc c
                                                                       731
      <210> 29
      <211> 822
      <212> DNA
      <213> Homo sapien
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<220>
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      <222> (1)...(822)
      \langle 223 \rangle n = A,T,C or G
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cgctcanacc tcacancctc ccnacnangc ctataangaa nannaataga nctgtncnnt
                                                                        120
aththtache teatanneet ennnaceeae teeetettaa eeentaetgt geetatngen
                                                                        180
tnnctantct ntgccgcctn cnanccaccn gtgggccnac cncnngnatt ctcnatctcc
                                                                        240
tenecatntn geetananta ngtneatace etatacetae necaatgeta nnnetaanen
                                                                        300
tecatnantt annntaacta ceaetgaent ngaetttene atnaneteet aatttgaate
                                                                        360
tactctgact cccacngcct annuattagc ancutccccc nacnatutct caaccaaatc
                                                                        420
ntcaacaacc tatctanctg ttcnccaacc nttncctccg atccccnnac aacccccctc
                                                                        480
ccaaataccc nccacctgac nectaaccen caccateceg gcaageenan ggneatttan
                                                                        540
ccactggaat cacnatngga naaaaaaac ccnaactctc tancncnnat ctccctaana
                                                                        600
aatnotootn naatttactn noantnocat caancocacn tgaaacnnaa cocctgtttt
                                                                        660
                                                                        720
tanatecett etttegaaaa cenaecettt annneceaac etttngggee ecceenetne
                                                                        780
ccnaatgaag gncncccaat cnangaaacg nccntgaaaa ancnaggcna anannntccg
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      <211> 787
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(787)
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                                                                         60
ctagagaaga cettetetee tactgteatt atggageeet geagactgag ggeteeeett
                                                                        120
gtctgcagga tttgatgtct gaagtcgtgg agtgtggctt ggagctcctc atctacatna
                                                                        180
gctggaagcc ctggagggcc tctctcgcca gcctccccct tctctccacg ctctccangg
                                                                        240
acaccagggg ctccaggcag cccattattc ccagnangac atggtgtttc tccacgcgga
                                                                        300
cccatggggc ctgnaaggcc agggtctcct ttgacaccat ctctcccgtc ctgcctggca
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ggccgtggga tccactantt ctanaacggn cgccaccncg gtgggagctc cagcttttgt
                                                                        420
tcccnttaat gaaggttaat tgcncgcttg gcgtaatcat nggtcanaac tntttcctgt
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gtgaaattgt ttntcccctc ncnattccnc ncnacatacn aacccggaan cataaagtgt
                                                                        540
taaageetgg gggtngeetn nngaatnaae tnaacteaat taattgegtt ggeteatgge
                                                                        600
cegettteen ttenggaaaa etgtenteee etgenttnnt gaateggeea eeeceenggg
                                                                        660
aaaageggtt tgenttttng ggggnteett cenetteece eetenetaan eeetnegeet
                                                                        720
cggtcgttnc nggtngcggg gaangggnat nnnctcccnc naagggggng agnnngntat
                                                                        780
                                                                        787
ccccaaa
      <210> 31
      <211> 799
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(799)
      <223> n = A, T, C or G
      <400> 31
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aacaaaggac teetgeagee ttetetgtet gtetettgge geaggeacat ggggaggeet	180
cccgcagggt gggggccacc agtccagggg tgggagcact acanggggtg ggagtgggtg	240
gtggctggtn cnaatggcct gncacanatc cctacgattc ttgacacctg gatttcacca	300
ggggaccttc tgttctccca nggnaacttc ntnnatctcn aaagaacaca actgtttctt	360
engeanttet ggetgtteat ggaaageaca ggtgteenat ttnggetggg aettggtaca	420
tatggttccg gcccacctct cccntcnaan aagtaattca ccccccccn ccntctnttg	480
cctgggccct taantaccca caccggaact canttantta ttcatcttng gntgggcttg	540
ntnatencen cetgaangeg ceaagttgaa aggeeaegee gtneeenete eecatagnan	600
nttttnncnt canctaatge eeeeeengge aacnateeaa teeeeeeen tgggggeeee	660
agcccangge eccegneteg ggnnneengn enegnantee ecaggntete ecantengne	720
connigence ecegeacgea gaacanaagg ntngageene egeannnnnn nggtnnenae	780
ctcgccccc ccnncgnng	799
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<211> 769 <212> DNA	
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(213) Nomo sapien	
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$\langle 223 \rangle$ n = A,T,C or G	
•	
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ggcaacaggc tccggcggcg gcggcggcgg ccctacctgc ggtaccaaat ntgcagcetc	180
cgctcccgct tgatnttcct ctgcagctgc aggatgccnt aaaacagggc ctcggccntn	240
ggtgggcacc ctgggatttn aatttccacg ggcacaatgc ggtcgcancc cctcaccacc	300
nattaggaat agtggtntta cccnccnccg ttggcncact ccccntggaa accacttntc	360
geggeteegg catetggtet taaacettge aaacnetggg geeetetttt tggttantnt	420
nccngccaca atcatnactc agactggcnc gggctggccc caaaaaancn ccccaaaacc	480
ggnecatgte ttnneggggt tgetgenatn tneateacet eeegggenea neaggneaac	540
ccaaaagttc ttgnggcccn caaaaaanct ccggggggnc ccagtttcaa caaagtcatc	600
coccttggcc cccaaatcct cccccgntt nctgggtttg ggaacccacg cctctnnctt	660
tggnnggcaa gntggntccc ccttcgggcc cccggtgggc ccnnctctaa ngaaaacncc	720
ntcctnnnca ccatccccc nngnnacgnc tancaangna tcccttttt tanaaacggg	780 789
	783
<210> 33	
<211> 793	
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<b>~220</b> \$	
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tggcgtaatc atggtcatan ctgtttcctg tgtgaaattg ttatccgctc acaattccac
                                                                       540
acaacatacg anceggaage atnaaatttt aaageetggn ggtngeetaa tgantgaact
                                                                       600
nactcacatt aattggettt gegeteaetg eeegetttee agteeggaaa acetgteett
                                                                       660
qccagctgcc nttaatgaat cnggccaccc cccggggaaa aggcngtttg cttnttgggg
                                                                       720
                                                                       780
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                                                                       793
acggtatena cet
      <210> 34
      <211> 756
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(756)
      <223> n = A, T, C or G
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                                                                       120
ccaaccacag ggaccaaget gaccaaacag cagetaatte tggeeegtga cataetggag
                                                                       180
atcggggccc aatggagcat cctacgcaan gacatcccct ccttcgagcg ctacatggcc
                                                                       240
                                                                       300
cageteaaat getaetaett tgattaeaan gageagetee eegagteage etatatgeae
                                                                       360
cagetettgg geeteaacet eetetteetg etgteeeaga aeegggtgge tgantneeae
acgganttgg ancggctgcc tgcccaanga catacanacc aatgtctaca tcnaccacca
                                                                       420
gtgtcctgga gcaatactga tgganggcag ctaccncaaa gtnttcctgg ccnagggtaa
                                                                       480
catececege egagagetae acettettea ttgacateet getegacaet ateagggatg
                                                                       540
aaaatcgcng ggttgctcca gaaaggctnc aanaanatcc ttttcnctga aggccccgg
                                                                       600
atnonotagt notagaatog goodgocato goggtggano otocaacott togttnocot
                                                                       660
ttactgaggg ttnattgccg cccttggcgt tatcatggtc acnccngttn cctgtgttga
                                                                       720
                                                                       756
aattnttaac ccccacaat tccacgccna cattng
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      <221> misc feature
      <222> (1)...(834)
      <223> n = A, T, C or G
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                                                                       120
aacaggatct tgcccttgaa gctctcggct gctgtnttta agttgctcag tctgccgtca
tagtcagaca cnctcttggg caaaaaacan caggatntga gtcttgattt cacctccaat
                                                                       180
aatcttengg getgtetget eggtgaacte gatgaenang ggeagetggt tgtgtntgat
                                                                       240
aaantccanc angtteteet tggtgacete eeetteaaag ttgtteegge etteateaaa
                                                                       300
                                                                       360
cttctnnaan angannance canctttgte gagetggnat ttgganaaca egteactgtt
qqaaactgat cccaaatggt atgtcatcca tcgcctctgc tgcctgcaaa aaacttgctt
                                                                       420
                                                                       480
ggcncaaatc cgactccccn tccttgaaag aagccnatca caccccctc cctggactcc
                                                                       540
nncaangact etneegetne ecenteenng eagggttggt ggeanneegg geeentgege.
                                                                       600
ttcttcagcc agttcacnat nttcatcagc ccctctgcca gctgttntat tccttggggg
                                                                       660
ggaanccqtc tctcccttcc tgaannaact ttgaccgtng gaatagccgc gcntcnccnt
                                                                       720
acntnetggg eegggtteaa anteeeteen ttgnennten eetegggeea ttetggattt
                                                                       780
ncenaacttt tteetteece enceeenegg ngtttggntt ttteatnggg ceceaactet
```

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getnttggee anteceetgg gggentntan enceeeetnt ggteeentng ggee
                                                                        834
       <210> 36
       <211> 814
       <212> DNA
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       <220>
       <221> misc_feature
       <222> (1) . . . (814)
       <223> n = A, T, C \text{ or } G
      <400> 36
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                                                                         60
cctagnaaac attaatgggt tgctctacta atacatcata cnaaccagta agcctgccca
                                                                        120
naacgccaac teaggccatt cetaceaaag gaagaaagge tggtetetee acceetgta
                                                                        180
ggaaaggcct gccttgtaag acaccacaat ncggctgaat ctnaagtctt gtgttttact
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aatggaaaaa aaaaataaac aanaggtttt gttctcatgg ctgcccaccg cagcctggca
                                                                        300
ctaaaacanc ccagcgctca cttctgcttg ganaaatatt ctttgctctt ttggacatca
                                                                        360
ggcttgatgg tatcactgcc acntttccac ccagctgggc ncccttcccc catntttgtc
                                                                        420
antganetgg aaggeetgaa nettagtete caaaagtete ngeecacaag aceggeeace
                                                                        480
aggggangtc ntttncagtg gatctgccaa anantacccn tatcatcnnt gaataaaaag
                                                                        540
gcccctgaac ganatgcttc cancancctt taagacccat aatcctngaa ccatggtgcc
                                                                        600
cttccggtct gatccnaaag gaatgttcct gggtcccant ccctcctttg ttncttacgt
                                                                        660
tgtnttggac centgetngn atnacecaan tganatecee ngaageacee tneeeetgge
                                                                        720
atttganttt cntaaattct ctgccctacn nctgaaagca cnattccctn ggcnccnaan
                                                                        780
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                                                                        814
      <210> 37
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      <212> DNA
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      <220>
      <221> misc_feature
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      <223> n = A,T,C or G
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                                                                       120
gtgtctggca ggtccacgca atgccctttg tcactgggga aatggatgcg ctggagctcg
                                                                       180
tenaanceae tegtgtattt tteacangea geeteeteeg aagenteegg geagttgggg
                                                                       240
gtgtcgtcac actccactaa actgtcgatn cancagccca ttgctgcagc ggaactgggt
                                                                       300
gggctgacag gtgccagaac acactggatn ggcctttcca tggaagggcc tgggggaaat
                                                                       360
encetnance caaactgeet etcaaaggee acettgeaca eccegacagg etagaaatge
                                                                       420
actettette ecaaaggtag ttgttettgt tgeecaagea neetecanea aaccaaaane
                                                                       480
ttgcaaaatc tgctccgtgg gggtcatnnn taccanggtt ggggaaanaa acccggcngn
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ganceneett gtttgaatge naaggnaata ateeteetgt ettgettggg tggaanagea
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caattgaact gttaacnttg ggccgngttc cnctngggtg gtctgaaact aatcaccgtc
                                                                       660
actggaaaaa ggtangtgcc ttccttgaat tcccaaantt cccctngntt tgggtnnttt
                                                                       720
ctcctctncc ctaaaaatcg tnttccccc ccntanggcg
                                                                       760
      <210> 38
      <211> 724
      <212> DNA
      <213> Homo sapien
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caaattaatt ttgganttta aattaaatnt tnattngggg aanaanccaa atgtnaagaa
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aatttaaccc attatnaact taaatnoctn gaaacccntg gnttccaaaa atttttaacc
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cttaaatccc tccgaaattg ntaanggaaa accaaattcn cctaaggctn tttgaaggtt
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ngatttaaac ccccttnant tnttttnacc cnngnctnaa ntatttngnt tccggtgttt
                                                                        360
tectnttaan entnggtaac teeegntaat gaannneet aaneeaatta aacegaattt
                                                                        420
tttttgaatt ggaaattccn ngggaattna ccggggtttt tcccntttgg gggccatncc
                                                                        480
cccnctttcg gggtttgggn ntaggttgaa tttttnnang ncccaaaaaa ncccccaana
                                                                        540
aaaaaactcc caagnnttaa ttngaatntc ccccttccca ggccttttgg gaaaggnggg
                                                                        600
tttntggggg cengggantt entteeceen ttnceneece eeceeenggt aaanggttat
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ngnntttggt ttttgggccc cttnanggac cttccggatn gaaattaaat ccccgggncg
                                                                        720
                                                                        724
gccg
      <210> 39
      <211> 751
      <212> DNA
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      <220>
      <221> misc_feature
      <222> (1)...(751)
      \langle 223 \rangle n = A,T,C or G
      <400> 39
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caacacaata tttatttcat ttgtttcttt tatttcattt tatttgtttg ctgctgctgt
                                                                        120
tttatttatt tttactgaaa gtgagaggga acttttgtgg ccttttttcc tttttctgta
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ggccgcctta agctttctaa atttggaaca tctaagcaag ctgaanggaa aagggggttt
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cgcaaaatca ctcgggggaa nggaaaggtt gctttgttaa tcatgcccta tggtgggtga
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                                                                        360
ttaactqctt qtacaattac ntttcacttt taattaattg tgctnaangc tttaattana
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cttgggggtt ccctccccan accaaccccn ctgacaaaaa gtgccngccc tcaaatnatg
teceggennt entigaaaca caengengaa ngtteteatt nteceenene cagginaaaa
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tgaagggtta ccatntttaa cnccacctcc acntggcnnn gcctgaatcc tcnaaaancn
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ccctcaanch aattnotning ccccggtone gentingtee eneccggget ecgggaantn
                                                                        600
                                                                        660
caccecenga annenntnne naacnaaatt cegaaaatat tecenntene teaatteeee
                                                                        720
cnnagactnt cctcnncnan cncaattttc ttttnntcac gaacncgnnc cnnaaaatgn
                                                                        751
nnnnencete enetngteen naatencean e
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cgccctatgc acagctgggc ccttgagaca gcagggcttc gatgtcaggc tcgatgtcaa
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tctcaaagtt ccaggcaacn tcgttgcgac acaccggaga ccaggtgatn agcttggggt
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cggtcataan cgcggtggcg tcgtcgctgg gagctggcag ggcctcccgc aggaaggcna
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ataaaaggtg cgcccccgca ccgttcanct cgcacttctc naanaccatg angttgggct
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cnaacccacc accanneegg actteettga nggaatteec aaatetette gntettggge
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ttctnctgat gccctanctg gttgcccngn atgccaanca nccccaance ccggggtcct
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aaancaccon cetectentt teatetgggt tnttntocce ggacentggt teetetcaag
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gganeceata tetenacean tacteacent necececent gnnacecane ettetanngn
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tteceneceg neetetggee enteaaanan gettneacna eetgggtetg eetteeeee
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      <212> DNA
      <213> Homo sapien
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ttctttaaac cttgttcatt atgaacactg aaaataggaa tttgtgaaga gttaaaaagt
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tatagettgt ttacgtagta agtttttgaa gtctacattc aatccagaca cttagttgag
                                                                        240
tgttaaactg tgatttttaa aaaatatcat ttgagaatat tctttcagag gtattttcat
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ttttactttt tgattaattg tgttttatat attagggtag t
                                                                       341
      <210> 42
      <211> 101
      <212> DNA
      <213> Homo sapien
      <400> 42
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gtttcaaaca ttctaaataa ataattttca gtggcttcat a
                                                                       101
      <210> 43
      <211> 305
      <212> DNA
      <213> Homo sapien
      <400> 43
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tecagggtgg teteacactg taattagage tattgaggag tetttacage aaattaagat
                                                                       120
tcagatgcct tgctaagtct agagttctag agttatgttt cagaaagtct aagaaaccca
                                                                       180
cctcttgaga ggtcagtaaa gaggacttaa tatttcatat ctacaaaatg accacaggat
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tcgaa
                                                                       305
     <210> 44
     <211> 852
     <212> DNA
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     <221> misc feature
     <222> (1)...(852)
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     <400> 44
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                                                                       120
ctctccatcc tegggcattc ttcccaaatt tatataccag tcttcgtcca tccacacgct
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ccagaatttc tcttttgtag taatatctca tagctcggct gagcttttca taggtcatgc
                                                                       240
tgctgttgtt cttctttta ccccatagct gagccactgc ctctgatttc aagaacctga
                                                                       300
agacgccctc agatcggtct tcccatttta ttaatcctgg gttcttgtct gggttcaaga
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ggatgtcgcg gatgaattcc cataagtgag tccctctcgg gttgtgcttt ttggtgtggc
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acttggcagg ggggtcttgc tcctttttca tatcaggtga ctctgcaaca ggaaggtgac
                                                                       480
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tgqtqqttqt catqqaqatc tgagcccggc agaaagtttt gctgtccaac aaatctactg
tqctaccata qttqqtqtca tataaatagt tctngtcttt ccaggtgttc atgatggaag
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                                                                       660
gctcagtttg ttcagtcttg acaatgacat tgtgtgtgga ctggaacagg tcactactgc
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actggccgtt ccacttcaga tgctgcaagt tgctgtagag gagntgcccc gccgtccctg
                                                                       780
ccgcccgggt gaactcctgc aaactcatgc tgcaaaggtg ctcgccgttg atgtcgaact
                                                                       840
cntggaaagg gatacaattg gcatccagct ggttggtgtc caggaggtga tggagccact
                                                                       852
cccacacctg gt
      <210> 45
      <211> 234
      <212> DNA
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agtictgacac catcoggage atcagcattg cttcgcagtg ccctaccgcg gggaactctt
                                                                       120
gcctcgtttc tggctggggt ctgctggcga acggcagaat gcctaccgtg ctgcagtgcg
                                                                       180
                                                                       234
tgaacgtgtc ggtggtgtct gaggaggtct gcagtaagct ctatgacccg ctgt
      <210> 46
      <211> 590
      <212> DNA
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      <221> misc_feature
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                                                                       120
                                                                       180
aaqaaqataa tatattccaa gcanatacaa aatatctaat gaaagatcaa ggcaggaaaa
                                                                       240
tgantataac taattgacaa tggaaaatca attttaatgt gaattgcaca ttatccttta
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aaaqctttca aaanaaanaa ttattqcaqt ctanttaatt caaacagtgt taaatggtat
caggataaan aactgaaggg canaaagaat taattttcac ttcatgtaac ncacccanat
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                                                                       420
ttacaatggc ttaaatgcan ggaaaaagca gtggaagtag ggaagtantc aaggtctttc
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tggtctctaa tctgccttac tctttgggtg tggctttgat cctctggaga cagctgccag
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qqctcctgtt atatccacaa tcccagcagc aagatgaagg gatgaaaaag gacacatgct
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                                                                       590
      <210> 47
      <211> 774
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(774)
      <223> n = A,T,C or G
```

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                                                                         120
 gcttcactgc ttgaaactta aatggatgtg ggacanaatt ttctgtaatg accctgaggg
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 cattacagac gggactetgg gaggaaggat aaacagaaag gggacaaagg ctaateccaa
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 aacatcaaag aaaggaaggt ggcgtcatac ctcccagcct acacagttct ccagggctct
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 ctggctcctg gtcttcagcc cccagctctg gaagcccacc ctctgctgat cctgcgtggc
                                                                         420
 ccacactcct tgaacacaca tccccaggtt atattcctgg acatggctga acctcctatt
                                                                         480
 cetactteeg agatgeettg etecetgeag cetgteaaaa teceaeteac eetecaaace
                                                                         540
 acggcatggg aagcctttct gacttgcctg attactccag catcttggaa caatccctga
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 ttccccactc cttagaggca agatagggtg gttaagagta gggctggacc acttggagcc
                                                                         660
 aggetgetgg etteaaattn tggeteattt aegagetatg ggaeettggg caagtnatet
                                                                         720
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                                                                         774
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       <212> DNA
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       <221> misc feature
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tggt
                                                                        124
      <210> 49
      <211> 147
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
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      <223> n = A,T,C or G
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                                                                        120
ttagggcacc catatcccaa gcantgt
                                                                        147
     · <210> 50
      <211> 107
      <212> DNA
      <213> Homo sapien
      <400> 50
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atggtttgag gttaggagga gttaggcata tgttttggga gaggggt
                                                                        107
      <210> 51
      <211> 204
      <212> DNA
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120

<213> Homo sapien <400> 51 qtcctaqqaa gtctagggga cacacgactc tggggtcacg gggccgacac acttgcacgg 60 cgggaaggaa aggcagagaa gtgacaccgt cagggggaaa tgacagaaag gaaaatcaag 120 180 gccttgcaag gtcagaaagg ggactcaggg cttccaccac agccctgccc cacttggcca 204 cctccctttt gggaccagca atgt <210> 52 <211> 491 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> (1)...(491) <223> n = A, T, C or G<400> 52 acaaagataa catttatctt ataacaaaaa tttgatagtt ttaaaggtta gtattgtgta - 60 gggtattttc caaaagacta aagagataac tcaggtaaaa agttagaaat gtataaaaca 120 ccatcagaca ggtttttaaa aaacaacata ttacaaaatt agacaatcat ccttaaaaaa 180 aaaacttctt gtatcaattt cttttgttca aaatgactga cttaantatt tttaaatatt 240 tcanaaacac ttcctcaaaa attttcaana tggtagcttt canatgtncc ctcagtccca 300 atgttgctca gataaataaa tctcgtgaga acttaccacc caccacaagc tttctggggc 360 atgcaacagt gtcttttctt tnctttttct ttttttttt ttacaggcac agaaactcat 420 caattttatt tggataacaa agggtctcca aattatattg aaaaataaat ccaagttaat 480 491 atcactcttg t <210> 53 <211> 484 <212> DNA <213> Homo sapien <220> <221> misc feature <222> (1)...(484)  $\langle 223 \rangle$  n = A,T,C or G <400> 53 acataattta gcagggctaa ttaccataag atgctattta ttaanaggtn tatgatctga 60 120 gtattaacag ttgctgaagt ttggtatttt tatgcagcat tttctttttg ctttgataac actacagaac ccttaaggac actgaaaatt agtaagtaaa gttcagaaac attagctgct 180 240 caatcaaatc tctacataac actatagtaa ttaaaacgtt aaaaaaaagt gttgaaatct 300 gcactagtat anaccgctcc tgtcaggata anactgcttt ggaacagaaa gggaaaaanc 360 agetttgant ttetttgtge tgatangagg aaaggetgaa ttacettgtt geeteteeet aatgattggc aggtcnggta aatnccaaaa catattccaa ctcaacactt cttttccncg 420 tancttgant ctgtgtattc caggancagg cggatggaat gggccagccc ncggatgttc 480 484 cant <210> 54 <211> 151 <212> DNA <213> Homo sapien <400> 54 60

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tetatgteet eteaagtgee tttttgtttg t	151
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gccctccagt ggatactcga gccaaagtgg t	91
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	133
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<212> DNA	
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atttaccaat gagttacctt gtaaatgaga agtcatgata gcactgaatt ttaactagtt	180
tgacttcta agtttggt	198
<210> 59	
<211> 330	
<212> DNA	
<213> Homo sapien	
<400> 59	

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ccattgaaaa ttatcattaa tgattttaaa tga	acaagtta tcaaaaactc actcaatttt 120
cacctgtgct agcttgctaa aatgggagtt aa	ctctagag caaatatagt atcttctgaa 180
tacagtcaat aaatgacaaa gccagggcct ac	aggtggtt tccagacttt ccagacccag 240
cagaaggaat ctattttatc acatggatct cc	gtctgtgc tcaaaatacc taatgatatt 300
tttcgtcttt attggacttc tttgaagagt	330
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<213> Homo sapien	
<400> 60	;
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gtcgtgggct ccttcctctt catcctcatc ca	getggtge tgeteatega etttgegeae 120
teetggaace ageggtgget gggcaaggee gag	ggagtgcg attcccgtgc ctggt 175
<210> 61	
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ggttgttgct cttcaacagt atcctcccct ttctggactgcac agccccgggg ctccacattg ct	
.210: 62	
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<211> 30 <212> DNA	
<213> Homo sapien	
400 62	
<pre>&lt;400&gt; 62 cgctcgagcc ctatagtgag tcgtattaga</pre>	30
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<400> 63	60
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ctgtatgaat aaaaatggtt atgtcaagt	
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accggagtaa ctgagtcggg acgctgaatc tg	
aatcagtgca tccaggattg gtccttggat ct	3ddc 3,
<210> 65	
<211> 377	
<212> DNA	
<213 Nomo ganien	

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```
<220>
       <221> misc_feature
       <222> (1)...(377)
       <223> n = A,T,C \text{ or } G
       <400> 65
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                                                                          60
 gcatggcgtc ctaggccttg acacagcggc tggggtttgg gctntcccaa accgcacacc
                                                                         120
 ccaaccetgg tetacceaca nttetggeta tgggetgtet etgecaetga acatcagggt
                                                                         180
 teggicataa natgaaatee caanggggae agaggteagt agaggaaget caatgagaaa
                                                                         240
 ggtgctgttt gctcagccag aaaacagctg cctggcattc gccgctgaac tatgaacccg
                                                                         300
 tgggggtgaa ctacccccan gaggaatcat gcctgggcga tgcaanggtg ccaacaggag
                                                                        : 360
 gggcgggagg agcatgt
                                                                         377
       <210> 66
       <211> 305
       <212> DNA
       <213> Homo sapien
       <400> 66
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                                                                         60
agaaccegtg tgccccttcc caccatatcc accetegete catetttgaa etcaaacacg
                                                                        120
aggaactaac tgcaccctgg tectetecec agtececagt teacceteca teceteacet
                                                                        180
tectecacte taagggatat caacactgee cageacaggg geeetgaatt tatgtggttt
                                                                        240
ttatatattt tttaataaga tgcactttat gtcattttt aataaagtct gaagaattac
                                                                        300
tgttt
                                                                        305
       <210> 67
       <211> 385
      <212> DNA
      <213> Homo sapien
      <400> 67
actacacaca ctccacttgc ccttgtgaga cactttgtcc cagcacttta ggaatgctga
                                                                         60
ggtcggacca gccacatctc atgtgcaaga ttgcccagca gacatcaggt ctgagagttc
                                                                        120 .
cccttttaaa aaaggggact tgcttaaaaa agaagtctag ccacgattgt gtagagcagc
                                                                        180
tgtgctgtgc tggagattca cttttgagag agttctcctc tgagacctga tctttagagg
                                                                        240
ctgggcagtc ttgcacatga gatggggctg gtctgatctc agcactcctt agtctgcttg
                                                                        300
cctctcccag ggccccagcc tggccacacc tgcttacagg gcactctcag atgcccatac
                                                                        360
catagtttct gtgctagtgg accgt
                                                                        385
      <210> 68
      <211> 73
      <212> DNA
      <213> Homo sapien
      <400> 68
acttaaccag atatattttt accccagatg gggatattct ttgtaaaaaa tgaaaataaa
                                                                         60
gtttttttaa tgg
                                                                         73
      <210> 69
      <211> 536
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (536)
```

```
<223> n = A, T, C or G
```

```
<400> 69
actagtccag tgtggtggaa ttccattgtg ttgggggctc tcaccctcct ctcctgcagc
                                                                         60
tecagetttg tgetetgeet etgaggagae catggeecag catetgagta ecetgetget
                                                                        120
cctgctggcc accctagctg tggccctggc ctggagcccc aaggaggagg ataggataat
                                                                        180
                                                                        240
cccgggtggc atctataacg cagacctcaa tgatgagtgg gtacagcgtg cccttcactt
cgccatcage gagtataaca aggccaccaa agatgactae tacagacgte cgctgcgggt
                                                                        300
actaagagcc aggcaacaga ccgttggggg ggtgaattac ttcttcgacg tagaggtggg
                                                                        360
cegaaccata tgtaccaagt cccagcccaa cttggacacc tgtgccttcc atgaacagcc
                                                                        420
agaactgcag aagaaacagt tgtgctcttt cgagatctac gaagttccct ggggagaaca
                                                                        480
gaangteeet gggtgaaate caggtgteaa gaaateetan ggatetgttg eeagge
                                                                        536
      <210> 70
      <211> 477
      <212> DNA
      <213> Homo sapien
     <400> 70
atgaccccta acaggggccc tctcagccct cctaatgacc tccggcctag ccatgtgatt
                                                                         60
tcacttccac tccataacge tcctcatact aggectacta accaacacac taaccatata
                                                                        120
ccaatgatgg cgcgatgtaa cacgagaaag cacataccaa ggccaccaca caccacctgt
                                                                        180
ccaaaaaggc cttcgatacg ggataatcct atttattacc tcagaagttt ttttcttcgc
                                                                        240
                                                                        300
agggattttt ctgagccttt taccactcca gcctagcccc taccccccaa ctaggagggc
actggccccc aacaggcatc accccgctaa atcccctaga agtcccactc ctaaacacat
                                                                        360
ccgtattact cgcatcagga gtatcaatca cctgagctca ccatagtcta atagaaaaca
                                                                        420
accgaaacca aattattcaa agcactgctt attacaattt tactgggtct ctatttt
                                                                        477.
      <210> 71
      <211> 533
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(533)
      \langle 223 \rangle n = A,T,C or G
      <400> 71
agagetatag gtacagtgtg ateteagett tgeaaacaca ttttetacat agatagtaet
                                                                         60
                                                                        120
aggtattaat agatatgtaa agaaagaaat cacaccatta ataatggtaa gattggttta
                                                                        180
tgtgatttta gtggtatttt tggcaccctt atatatgttt tccaaacttt cagcagtgat
                                                                        240
attatttcca taacttaaaa agtgagtttg aaaaagaaaa tctccagcaa gcatctcatt
                                                                        300
taaataaagg tttgtcatct ttaaaaaatac agcaatatgt gactttttaa aaaagctgtc
aaataggtgt gaccctacta ataattatta gaaatacatt taaaaacatc gagtacctca
                                                                        360
                                                                        420
agtcagtttg ccttgaaaaa tatcaaatat aactcttaga gaaatgtaca taaaagaatg
cttcgtaatt ttggagtang aggttccctc ctcaattttg tatttttaaa aagtacatgg
                                                                        480
taaaaaaaaa aattcacaac agtatataag gctgtaaaat gaagaattct gcc
                                                                        533
      <210> 72
      <211> 511
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(511)
      \langle 223 \rangle n = A,T,C or G
```

```
<400> 72
 tattacggaa aaacacacca cataattcaa ctancaaaga anactgcttc agggcgtgta
                                                                        60
 aaatgaaagg cttccaggca gttatctgat taaagaacac taaaagaggg acaaggctaa
                                                                       120
 aagccgcagg atgtctacac tatancaggc gctatttggg ttggctggag gagctgtgga
                                                                       180
 aaacatggan agattggtgc tgganatcgc cgtggctatt cctcattgtt attacanagt
                                                                       240
 gaggttetet gtgtgeecae tggtttgaaa accgttetne aataatgata gaatagtaca
                                                                       300
 cacatgagaa ctgaaatggc ccaaacccag aaagaaagcc caactagatc ctcagaanac
                                                                       360
 gettetaggg acaataaccg atgaagaaaa gatggcetee ttgtgcecce gtetgttatg
                                                                       420
 atttctctcc attgcagcna naaacccgtt cttctaagca aacncaggtg atgatggcna
                                                                       480
 aaatacaccc cctcttgaag naccnggagg a
                                                                       511
       <210> 73
       <211> 499
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (499)
      <223> n = A, T, C or G
      <400> 73
cagtgccage actggtgcca gtaccagtac caataacagt gccagtgcca gtgccagcac
                                                                       60
cagtggtggc ttcagtgctg gtgccagcct gaccgccact ctcacatttg ggctcttcgc
                                                                      120
tggccttggt ggagctggtg ccagcaccag tggcagctct ggtgcctgtg gtttctccta
                                                                      180
caagtgagat tttagatatt gttaatcctg ccagtctttc tcttcaagcc agggtgcatc
                                                                      240
ctcagaaacc tactcaacac agcactctag gcagccacta tcaatcaatt gaagttgaca
                                                                      300
360
antctagagg gcccgtttaa acccgctgat cagcctcgac tgtgccttct anttgccagc
                                                                      420
catctgttgt ttgcccctcc cccgntgcct tccttgaccc tggaaagtgc cactcccact
                                                                      480
gtcctttcct aantaaaat
                                                                      499
      <210> 74
      <211> 537
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(537)
      \langle 223 \rangle n = A,T,C or G
      <400> 74
tttcatagga gaacacactg aggagatact tgaagaattt ggattcagcc gcgaagagat
                                                                       60
ttatcagctt aactcagata aaatcattga aagtaataag gtaaaagcta gtctctaact
                                                                     120
tecaggeeca eggeteaagt gaatttgaat actgeattta eagtgtagag taacacataa
                                                                     180
cattgtatgc atggaaacat ggaggaacag tattacagtg tcctaccact ctaatcaaga
                                                                     240
aaagaattac agactctgat tctacagtga tgattgaatt ctaaaaatgg taatcattag
                                                                     300
ggcttttgat ttataanact ttgggtactt atactaaatt atggtagtta tactgccttc
                                                                     360
cagtttgctt gatatattg ttgatattaa gattcttgac ttatattttg aatgggttct
                                                                     420
actgaaaaan gaatgatata ttcttgaaga catcgatata catttattta cactcttgat
                                                                     480
tctacaatgt agaaaatgaa ggaaatgccc caaattgtat ggtgataaaa gtcccgt
                                                                     537
     <210> 75
     <211> 467
     <212> DNA
     <213> Homo sapien
```

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<220>
      <221> misc feature
      <222> (1)...(467)
      <223> n = A, T, C or G
      <400> 75
                                                                         60
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tgcatattac acgtacctcc tcctgctcct caagtagtgt ggtctatttt gccatcatca
                                                                        120
                                                                        180
cctgctgtct gcttagaaga acggctttct gctgcaangg agagaaatca taacagacgg
tggcacaagg aggccatctt ttcctcatcg gttattgtcc ctagaagcgt cttctgagga
                                                                        240
tctagttggg ctttctttct gggtttgggc catttcantt ctcatgtgtg tactattcta
                                                                        300
                                                                        360
tcattattgt ataacggttt tcaaaccngt gggcacncag agaacctcac tctgtaataa
caatgaggaa tagccacggt gatctccagc accaaatctc tccatgttnt tccagagctc
                                                                        420
ctccagccaa cccaaatagc cgctgctatn gtgtagaaca tccctgn
                                                                        467
      <210> 76
      <211> 400
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(400)
      <223> n = A, T, C or G
      <400> 76
aagetgacag cattegggee gagatgtete geteegtgge ettagetgtg etegegetae
                                                                        60
tetetette tggeetggag getatecage gtactecaaa gatteaggtt tacteaegte
                                                                       120
atccagcaga gaatggaaag tcaaatttcc tgaattgcta tgtgtctggg tttcatccat
                                                                       180
ccgacattga agttgactta ctgaagaatg gagagagaat tgaaaaagtg gagcattcag
                                                                       240
acttgtcttt cagcaaggac tggtctttct atctcttgta ctacactgaa ttcacccca
                                                                       300
ctgaaaaaga tgagtatgcc tgccgtgtga accatgtgac tttgtcacag cccaagatng
                                                                       360
                                                                       400
ttnagtggga tcganacatg taagcagcan catgggaggt
      <210> 77
      <211> 248
      <212> DNA
      <213> Homo sapien
      <400> 77
                                                                        60
ctggagtgcc ttggtgtttc aagcccctgc aggaagcaga atgcaccttc tgaggcacct
ccagetgeec eggegggga tgegaggete ggageaceet tgeeeggetg tgattgetge
                                                                       120
caggeactgt teateteage tittetgice cittgeteee ggeaageget teigetgaaa
                                                                       180
                                                                       240
gttcatatct ggagcctgat gtcttaacga ataaaggtcc catgctccac ccgaaaaaaa
                                                                       248
      <210> 78
      <211> 201
      <212> DNA
      <213> Homo sapien
      <400> 78
                                                                        60
actagtccag tgtggtggaa ttccattgtg ttgggcccaa cacaatggct acctttaaca
                                                                       120
tcacccagac cccgccctgc ccgtgcccca cgctgctgct aacgacagta tgatgcttac
totgotacto ggaaactatt tttatgtaat taatgtatgo tttottgttt ataaatgoot
                                                                       180
                                                                       201
gatttaaaaa aaaaaaaaa a
```

```
<210> 79
      <211> 552
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(552)
      <223> n = A, T, C or G
      <400> 79
tccttttgtt aggtttttga gacaacccta gacctaaact gtgtcacaga cttctgaatg
                                                                       : 60
tttaggcagt gctagtaatt tcctcgtaat gattctgtta ttactttcct attctttatt
                                                                        120
cctctttctt ctgaagatta atgaagttga aaattgaggt ggataaatac aaaaaqqtaq
                                                                        180
tgtgatagta taagtatcta agtgcagatg aaagtgtgtt atatatatcc attcaaaatt
                                                                        240
atgcaagtta gtaattactc agggttaact aaattacttt aatatgctgt tgaacctact
                                                                        300
ctgttccttg gctagaaaaa attataaaca ggactttgtt agtttgggaa gccaaattga
                                                                        360
taatattcta tgttctaaaa gttgggctat acataaanta tnaagaaata tggaatttta
                                                                        420
ttcccaggaa tatggggttc atttatgaat antacccggg anagaagttt tgantnaaac
                                                                        480
cngttttggt taatacgtta atatgtcctn aatnaacaag gcntgactta tttccaaaaa
                                                                        540
aaaaaaaaa aa
                                                                        552
      <210> 80
      <211> 476
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(476)
      \langle 223 \rangle n = A,T,C or G
      <400> 80
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                                                                       60
ggggaaaatg gggcctagaa gttacagagc atctagctgg tgcgctggca cccctggcct
                                                                        120
cacacagact cccgagtagc tgggactaca ggcacacagt cactgaagca ggccctgttt
                                                                        180
gcaattcacg ttgccacctc caacttaaac attettcata tgtgatgtcc ttagtcacta
                                                                        240
aggttaaact ttcccaccca gaaaaggcaa cttagataaa atcttagagt actttcatac
                                                                        300
tettetaagt cetettecag ceteaetttg agteeteett gggggttgat aggaantnte
                                                                        360
tcttggcttt ctcaataaaa tctctatcca tctcatgttt aatttggtac gcntaaaaat
                                                                        420
gctgaaaaaa ttaaaatgtt ctggtttcnc tttaaaaaaa aaaaaaaaaa aaaaaa
                                                                        476
      <210> 81
      <211> 232
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(232)
      <223> n = A, T, C or G
      <400> 81
tttttttttg tatgeenten etgtggngtt attgttgetg ceaccetgga ggageecagt
                                                                        60
ttettetgta tetttetttt etgggggate tteetggete tgeeeeteea tteecageet
                                                                       120
eteateecea tettgeactt ttgetagggt tggaggeget tteetggtag eeeeteagag
                                                                       180
actcagtcag cgggaataag tcctaggggt ggggggtgtg gcaagccggc ct
                                                                       232
```

```
<210> 82
      <211> 383
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(383)
      \langle 223 \rangle n = A,T,C or G
      <400> 82
aggegggage agaagetaaa gecaaageee aagaagagtg geagtgeeag caetggtgee
                                                                          60
agtaccagta ccaataacat gccagtgcca gtgccagcac cagtggtggc ttcagtgctg
                                                                         120
gtgccagcct gaccgccact ctcacatttg ggctcttcgc tggccttggt ggagctggtg
                                                                         180
                                                                         240
ccaqcaccag tggcagctct ggtgcctgtg gtttctccta caagtgagat tttagatatt
gttaatcctg ccagtctttc tcttcaagcc agggtgcatc ctcagaaacc tactcaacac
                                                                         300
                                                                         360
agcactctng gcagccacta tcaatcaatt gaagttgaca ctctgcatta aatctatttg
                                                                         383
ccatttcaaa aaaaaaaaaa aaa
      <210> 83
      <211> 494
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(494)
      \langle 223 \rangle n = A,T,C or G
      <400> 83
                                                                         60
accgaattgg gaccgctggc ttataagcga tcatgtcctc cagtattacc tcaacgagca
                                                                         120
gggagatcga gtctatacgc tgaagaaatt tgacccgatg ggacaacaga cctgctcagc
ccatcctgct cggttctccc cagatgacaa atactctcga caccgaatca ccatcaagaa
                                                                         180
acgcttcaag gtgctcatga cccagcaacc gcgccctgtc ctctgagggt ccttaaactg
                                                                         240
atgtetttte tgeeacetgt tacceetegg agaeteegta accaaactet teggaetgtg
                                                                         300
                                                                         360
agecetgatg cetttttgcc agecatacte tttggentec agtetetegt ggegattgat
tatgcttgtg tgaggcaatc atggtggcat cacccatnaa gggaacacat ttganttttt
                                                                         420
tttcncatat tttaaattac naccagaata nttcagaata aatgaattga aaaactctta
                                                                        480
aaaaaaaaa aaaa
                                                                        494
      <210> 84
      <211> 380
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(380)
      \langle 223 \rangle n = A,T,C or G
      <400> 84
                                                                         60
gctggtagcc tatggcgtgg ccacggangg gctcctgagg cacgggacag tgacttccca
                                                                        120
agtatectge geegegtett etaeegteee taeetgeaga tettegggea gatteeceag
gaggacatgg acgtggccct catggagcac agcaactgct cgtcggagcc cggcttctgg
                                                                        180
gcacaccete etggggeeca ggegggeace tgegtetece agtatgeeaa etggetggtg
                                                                        240
gtgctgctcc tcgtcatctt cctgctcgtg gccaacatcc tgctggtcac ttgctcattg
                                                                        300
                                                                        360
ccatgttcag ttacacattc ggcaaagtac agggcaacag cnatctctac tgggaaggcc
                                                                        380
agegttneeg ceteateegg
```

```
<210> 85
       <211> 481
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1)...(481)
       \langle 223 \rangle n = A,T,C or G
       <400> 85
gagttagete etecacaace ttgatgaggt egtetgeagt ggeetetege tteatacege
                                                                           60
 tnccatcgtc atactgtagg tttgccacca cctcctgcat cttggggcgg ctaatatcca
                                                                          120
ggaaactctc aatcaagtca ccgtcnatna aacctgtggc tggttctgtc ttccgctcgg
                                                                          180
tgtgaaagga tctccagaag gagtgctcga tcttccccac acttttgatg actttattga
                                                                          240
gtcgattctg catgtccage aggaggttgt accagetete tgacagtgag gtcaccagee
                                                                          300
ctatcatgcc nttgaacgtg ccgaagaaca ccgagccttg tgtggggggt gnagtctcac
                                                                          360
ccagattctg cattaccaga nagccgtggc aaaaganatt gacaactcgc ccaggnngaa
                                                                          420
aaagaacacc teetggaagt getngeeget eetegteent tggtggnnge gentneettt
                                                                          480
                                                                          481
       <210> 86
       <211> 472
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(472)
      \langle 223 \rangle n = A,T,C or G
      <400> 86
aacatettee tgtataatge tgtgtaatat egateegatn ttgtetgetg agaatteatt
                                                                          60 -
acttggaaaa gcaacttnaa gcctggacac tggtattaaa attcacaata tgcaacactt
                                                                         120
taaacagtgt gtcaatctgc tcccttactt tgtcatcacc agtctgggaa taagggtatg
                                                                         180
ccctattcac acctgttaaa agggcgctaa gcatttttga ttcaacatct tttttttga
                                                                         240
cacaagtccg aaaaaagcaa aagtaaacag ttnttaattt gttagccaat tcactttctt
                                                                         300
catgggacag agccatttga tttaaaaagc aaattgcata atattgagct ttgggagctg
                                                                         360
atatntgage ggaagantag cetttetaet teaccagaca caacteettt catattggga
                                                                         420
tgttnacnaa agttatgtct cttacagatg ggatgctttt gtggcaattc tg
                                                                         472
      <210> 87
      <211> 413
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(413)
      \langle 223 \rangle n = A,T,C or G
      <400> 87
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                                                                         60
tgtgtgtgcg cgcatattat atagacaggc acatcttttt tacttttgta aaagcttatg
                                                                         120
cctctttggt atctatatct gtgaaagttt taatgatctg ccataatgtc ttggggacct
                                                                         180
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt
                                                                         240
tttattcgac atgaaggaaa tttccagatn acaacactna caaactctcc cttgactagg
                                                                         300
```

```
ggggacaaag aaaagcanaa ctgaacatna gaaacaattn cctggtgaga aattncataa
                                                                        360
acagaaattg ggtngtatat tgaaananng catcattnaa acgttttttt ttt
                                                                         413
      <210> 88
      <211> 448
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(448)
      <223> n = A, T, C or G
     <400> 88
cgcagcgggt cctctctatc tagctccagc ctctcgcctg ccccactccc cgcgtcccgc
                                                                         60
gtcctagccn accatggccg ggcccctgcg cgccccgctg ctcctgctgg ccatcctggc
                                                                        120
                                                                        180
cgtggccctg gccgtgagcc ccgcggccgg ctccagtccc ggcaagccgc cgcgcctggt
gggaggccca tggaccccgc gtggaagaag aaggtgtgcg gcgtgcactg gactttgccg
                                                                        240
teggenanta caacaaacee geaacnaett ttacenagen egegetgeag gttgtgeege
                                                                        300
cccaancaaa ttgttactng gggtaantaa ttcttggaag ttgaacctgg gccaaacnng
                                                                        360
tttaccagaa ccnagccaat tngaacaatt neceetecat aacageceet tttaaaaagg
                                                                        420
                                                                        448
gaancantcc tgntcttttc caaatttt
      <210> 89
      <211> 463
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) . . . (463)
      <223> n = A, T, C \text{ or } G
      <400> 89
                                                                         60
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gtagtgattc tgccaaagtt ggtgttgtaa catgagtatg taaaatgtca aaaaattagc
                                                                        120
agaggtetag gtetgeatat cageagacag tttgteegtg tattttgtag cettgaagtt
                                                                        180
ctcagtgaca agttnnttct gatgcgaagt tctnattcca gtgttttagt cctttgcatc
                                                                        240
tttnatgttn agacttgcct ctntnaaatt gcttttgtnt tctgcaggta ctatctgtgg
                                                                        300
tttaacaaaa tagaannact tctctgcttn gaanatttga atatcttaca tctnaaaatn
                                                                        360
                                                                        420
aattetetee ceatannaaa acceangece ttggganaat ttgaaaaang gnteettenn
                                                                        463
aattennana antteagntn teatacaaca naaenggane ecc
      <210> 90
      <211> 400
      <212> DNA
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      <220>
      <221> misc_feature
      <222> (1)...(400)
      <223> n = A, T, C \text{ or } G
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                                                                         60
cttccactca ctgtctgtaa gcntnttaac ccagactgta tcttcataaa tagaacaaat
                                                                        120
tetteaccag teacatette taggacettt ttggatteag ttagtataag etetteeact
                                                                        180
tcctttgtta agacttcatc tggtaaagtc ttaagttttg tagaaaggaa tttaattgct
                                                                        240
```

```
cgttctctaa caatgtcctc tccttgaagt atttggctga acaacccacc tnaagtccct
                                                                         300
 ttgtgcatcc attttaaata tacttaatag ggcattggtn cactaggtta aattctgcaa
                                                                         360
 gagtcatctg tctgcaaaag ttgcgttagt atatctgcca
                                                                         400
       <210> 91
       <211> 480
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(480)
       <223> n = A, T, C or G
       <400> 91
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                                                                          60
ggtctacccc acatgggagc agcatgccgt agntatataa ggtcattccc tgagtcagac
                                                                         120
 atgeetettt gaetaeegtg tgeeagtget ggtgattete acacacetee nneegetett
                                                                         180
 tgtggaaaaa ctggcacttg nctggaacta gcaagacatc acttacaaat tcacccacga
                                                                         240
gacacttgaa aggtgtaaca aagcgactct tgcattgctt tttgtccctc cggcaccagt
                                                                         300
 tgtcaatact aaccegetgg tttgcctcca tcacatttgt gatctgtagc tctggataca
                                                                         360
teteetgaca gtactgaaga acttettett ttgttteaaa ageaactett ggtgeetgtt
                                                                         420
ngatcaggtt cccatttccc agtccgaatg ttcacatggc atatnttact tcccacaaaa
                                                                         480
       <210> 92
       <211> 477
       <212> DNA
       <213> Homo sapien
       <220>
      <221> misc_feature
       <222> (1)...(477)
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       <400> 92
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                                                                        120
cccacgcagg cagcagcggg gccggtcaat gaactccact cgtggcttgg ggttgacggt
                                                                        180
taantgcagg aagaggctga ccacctcgcg gtccaccagg atgcccgact gtgcgggacc
                                                                        240
tgcagcgaaa ctcctcgatg gtcatgagcg ggaagcgaat gangcccagg gccttgccca
                                                                        300
gaacetteeg cetgttetet ggegteacet geagetgetg cegetnacae teggeetegg
                                                                        360
accageggae aaaeggegtt gaacageege accteaegga tgeecantgt gtegegetee
                                                                        420
aggaacggen ceagegtgte caggteaatg teggtgaane etcegegggt aatggeg
                                                                        477
      <210> 93
      <211> 377
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(377)
      <223> n = A,T,C \text{ or } G
      <400> 93
gaacggctgg accttgcctc gcattgtgct gctggcagga ataccttggc aagcagctcc
                                                                         60
agtecgagea geceeagace getgeegeee gaagetaage etgeetetgg cetteeeete
                                                                       120
cgcctcaatg cagaaccant agtgggagca ctgtgtttag agttaagagt gaacactgtn
                                                                       180
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```
tgattttact tgggaatttc ctctgttata tagcttttcc caatgctaat ttccaaacaa
                                                                         240
caacaacaaa ataacatgtt tgcctgttna gttgtataaa agtangtgat tctgtatnta
                                                                         300
                                                                         360
aaqaaaatat tactgttaca tatactgctt gcaanttctg tatttattgg tnctctggaa
                                                                         377
ataaatatat tattaaa
      <210> 94
      <211> 495
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(495)
      <223> n = A, T, C \text{ or } G
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                                                                          60
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cgagctgang cagatttccc acagtgaccc cagagccctg ggctatagtc tctgacccct
                                                                         120
ccaaggaaag accaccttct ggggacatgg gctggagggc aggacctaga ggcaccaagg
                                                                         180
gaaggcccca ttccggggct gttccccgag gaggaaggga aggggctctg tgtgccccc
                                                                         240
acgaggaana ggccctgant cctgggatca nacacccctt cacgtgtatc cccacacaaa
                                                                         300
tgcaagctca ccaaggtccc ctctcagtcc cttccctaca ccctgaacgg ncactggccc
                                                                         360
                                                                         420
acacccaccc agancancca cccgccatgg ggaatgtnct caaggaatcg cngggcaacg
tggactetng tecennaagg gggeagaate tecaatagan gganngaace ettgetnana
                                                                         480
                                                                         495
aaaaaaana aaaaa
      <210> 95
      <211> 472
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
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      \langle 223 \rangle n = A,T,C or G
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cctctggaag ccttgcgcag agcggacttt gtaattgttg gagaataact gctgaatttt
                                                                        120
tagetgtttt gagttgatte geaceactge accaeacte aatatgaaaa etatttnact
                                                                        180
tatttattat cttgtgaaaa gtatacaatg aaaattttgt tcatactgta tttatcaagt
                                                                        240
                                                                        300
atgatgaaaa gcaatagata tatattettt tattatgttn aattatgatt gccattatta
                                                                        360
atcggcaaaa tgtggagtgt atgttctttt cacagtaata tatgcctttt gtaacttcac
ttggttattt tattgtaaat gaattacaaa attcttaatt taagaaaatg gtangttata
                                                                        420
                                                                        472
tttanttcan taatttcttt ccttgtttac gttaattttg aaaagaatgc at
      <210> 96
      <211> 476
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(476)
      \langle 223 \rangle n = A,T,C or G
      <400> 96
ctgaagcatt tcttcaaact tntctacttt tgtcattgat acctgtagta agttgacaat
                                                                         60
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gtggtgaaat ttcaaaatta tatgtaactt ctactagttt tactttctcc cccaagtctt
                                                                         120
 ttttaactca tgatttttac acacacaatc cagaacttat tatatagcct ctaagtcttt
                                                                         180
 attetteaca gragatgatg aaagagteet ceagtgtett gngcanaatg ttetagntat
                                                                         240
 agctggatac atacngtggg agttctataa actcatacct cagtgggact naaccaaaat
                                                                         300
 tgtgttagtc tcaattccta ccacactgag ggagcctccc aaatcactat attcttatct
                                                                         360
 gcaggtactc ctccagaaaa acngacaggg caggcttgca tgaaaaagtn acatctgcqt
                                                                         420
 tacaaagtet atetteetea nangtetgtn aaggaacaat ttaatettet agettt
                                                                         476
       <210> 97
       <211> 479
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(479)
       \langle 223 \rangle n = A,T,C or G
       <400> 97
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 aaataatgct gcaaacttaa tgttcttatg caaaatggaa cgctaatgaa acacagctta
                                                                        120
 caatcgcaaa tcaaaactca caagtgctca tctgttgtag atttagtgta ataagactta
                                                                        180
gattgtgctc cttcggatat gattgtttct canatcttgg gcaatnttcc ttagtcaaat
                                                                        240
 caggetacta gaattetgtt attggatatn tgagageatg aaatttttaa naatacaett
                                                                        300
gtgattatna aattaatcac aaatttcact tatacctgct atcagcagct agaaaaacat
                                                                        360
ntnnttttta natcaaagta ttttgtgttt ggaantgtnn aaatgaaatc tgaatgtggg
                                                                        420
ttcnatctta ttttttcccn gacnactant tnctttttta gggnctattc tganccatc
                                                                        479
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       <211> 461
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tgctagttcc tgtcatctat tcgctactaa atgcagactg gaggggacca aaaaggggca
                                                                        120
tcaactccag ctggattatt ttggagcctg caaatctatt cctacttgta cggactttga
                                                                        180
agtgattcag tttcctctac ggatgagaga ctggctcaag aatatcctca tgcagcttta
                                                                        240
tgaagccact ctgaacacgc tggttatcta gatgagaaca gagaaataaa gtcagaaaat
                                                                        300
ttacctggag aaaagaggct ttggctgggg accatcccat tgaaccttct cttaaggact
                                                                        360
ttaagaaaaa ctaccacatg ttgtgtatcc tggtgccggc cgtttatgaa ctgaccaccc
                                                                        420
tttggaataa tettgaeget eetgaaettg eteetetgeg a
                                                                        461
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      <211> 171
      <212> DNA
      <213> Homo sapien
      <400> 99
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cggcgcctct gcgggcccga ggaggagcgg ctggcgggtg gggggagtgt gacccaccct
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cggtgagaaa agcettetet agegatetga gaggegtgee ttgggggtae e
                                                                       171
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      <212> DNA
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                                                                      120
aaqqctgagc tgacgccgca gaggtcgtgt cacgtcccac gaccttgacg ccgtcgggga
                                                                      180
                                                                      240
caqccgqaac agagcccggt gaagcgggag gcctcgggga gcccctcggg aagggcggcc
                                                                      269
cgagagatac gcaggtgcag gtggccgcc
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      <211> 405
      <212> DNA
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      <400> 101
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                                                                       60
gctagcaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg
                                                                      120
ttgattggtt tgtctttatg ggggcggggt ggggtagggg aaacgaagca aataacatgg
                                                                      180
agtgggtgca ccctccctgt agaacctggt tacaaagctt ggggcagttc acctggtctg
                                                                      240
tgaccgtcat tttcttgaca tcaatgttat tagaagtcag gatatctttt agagagtcca
                                                                      300
ctgttctgga gggagattag ggtttcttgc caaatccaac aaaatccact gaaaaagttg
                                                                      360
                                                                      405
gatgatcagt acgaataccg aggcatattc tcatatcggt ggcca
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      <211> 470
      <212> DNA
      <213> Homo sapien
      <400> 102
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                                                                      120
                                                                      180
tcaaaatcta aattattcaa attaqccaaa tccttaccaa ataataccca aaaatcaaaa
atatacttct ttcagcaaac ttgttacata aattaaaaaa atatatacgg ctggtgtttt
                                                                      240
caaagtacaa ttatcttaac actgcaaaca ttttaaggaa ctaaaataaa aaaaaacact
                                                                      300
ccgcaaaggt taaagggaac aacaaattct tttacaacac cattataaaa atcatatctc
                                                                      360
                                                                      420
aaatcttagg ggaatatata cttcacacgg gatcttaact tttactcact ttgtttattt
                                                                      470
ttttaaacca ttgtttgggc ccaacacaat ggaatccccc ctggactagt
      <210> 103
      <211> 581
      <212> DNA
      <213> Homo sapien
      <400> 103
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                                                                      120
                                                                      180
taaatggaaa ctgccttaga tacataattc ttaggaatta gcttaaaatc tgcctaaagt
gaaaatcttc tctagctctt ttgactgtaa atttttgact cttgtaaaac atccaaattc
                                                                      240
atttttcttg tctttaaaat tatctaatct ttccattttt tccctattcc aagtcaattt
                                                                      300
gcttctctag cctcatttcc tagctcttat ctactattag taagtggctt ttttcctaaa
                                                                      360
agggaaaaca ggaagagaaa tggcacacaa aacaaacatt ttatattcat atttctacct
                                                                      420
                                                                      480
acgttaataa aatagcattt tgtgaagcca gctcaaaaga aggcttagat ccttttatgt
                                                                      540
ccattttagt cactaaacga tatcaaagtg ccagaatgca aaaggtttgt gaacatttat
                                                                      581
tcaaaagcta atataagata tttcacatac tcatctttct g
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<211> 578 <212> DNA

<213> Homo sapien

	)> 104			_		
contatata		. ctttttctctt	CTTTTTTTT	gaaatgagga	tcgagttttt	60
cactetetag	atayyycaty	aagaaaacto	atettteeag	ctttaaaata	acaatcaaat	120
aggazatoto	. ataccacaci	. tradytrada	. ccaacgagec	actggettat	ctteteetga tgeatattga	180
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	tgttattatt			oocacaagee	. retattagaa	578
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	.> 538			•		
	> DNA			•		
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	> 105					
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agatatgttt	cctttgccaa	tattaaaaaa	ataataatgt	ttactactag	tgaaaccc .	480 538
c210	> 106					
	> 473					
	> DNA					
	> Homo sapi	en				
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tttataaatg	taaggtgcca	ttattgagta	atatatteet	ccaagactgg	atototocot	180
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gcaaacgcta	attctcttct	ccatccccat	gtgatattgt	gtatatgtgt	gagttggtag	300
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tggtgagaat	ccgtatgccc	cgctgaatct	cctggctgac	tttgctggtg	gtggccttat	480
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<211> 382

<212> PRT

<213> Homo sapien

<400> 108

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DAIGNOOIDE JAIN OFFICIONAN L.

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Gln Asp Val Ser Pro Arg Pro Ala Pro Leu Leu Asn Thr Pro Ala
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280

Thr Leu Phe Tyr Thr Asp Phe Val Gly Glu Gly Leu Tyr Gln Gly Val 295 Pro Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly 310 315 Val Arg Met Gly Ser Leu Gly Leu Phe Leu Gln Cys Ala Ile Ser Leu 325 330 Val Phe Ser Leu Val Met Asp Arg Leu Val Gln Arg Phe Gly Thr Arg 340 345 Ala Val Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala 360 Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu 375 380 Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr Leu Ala 390 395 Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro Lys Tyr Arg Gly 405 410 Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser Leu Met Thr Ser Phe Leu 420 425 Pro Gly Pro Lys Pro Gly Ala Pro Phe Pro Asn Gly His Val Gly Ala 440 445 Gly Gly Ser Gly Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser 455 460 Ala Cys Asp Val Ser Val Arg Val Val Gly Glu Pro Thr Glu Ala 470 475 Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp 485 490 Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met Gly Ser 505 Ile Val Gln Leu Ser Gln Ser Val Thr Ala Tyr Met Val Ser Ala Ala 520 525 Gly Leu Gly Leu Val Ala Ile Tyr Phe Ala Thr Gln Val Val Phe Asp 535 540 Lys Ser Asp Leu Ala Lys Tyr Ser Ala 545

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His Asp Gln Lys Val Glu Gly Cys Phe Asn Gln Leu Leu Tyr Asp Ile
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Arg Thr Asn Ala Val Thr Val Gly Gly Val Ala Ala Gly Ile Gly Gly
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aantcctggg t
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      <223> n = A,T,C or G
      <400> 123
tgtagcgtga agacnacaga atggtgtgtg ctgtgctatc caggaacaca tttattatca
                                                                         60
ttatcaanta ttgtgt
                                                                         76 ·
      <210> 124
      <211> 131
      <212> DNA
      <213> Homo sapien
      <400> 124
acctttcccc aaggccaatg tcctgtgtgc taactggccg gctgcaggac agctgcaatt
                                                                         60
caatgtgctg ggtcatatgg aggggaggag actctaaaat agccaatttt attctcttgg
                                                                        120
ttaagatttg t
                                                                        131
      <210> 125
      <211> 432
      <212> DNA
      <213> Homo sapien
      <400> 125
actttatcta ctggctatga aatagatggt ggaaaattgc gttaccaact ataccactgg
                                                                         60
cttgaaaaag aggtgatagc tcttcagagg acttgtgact tttgctcaga tgctgaagaa
                                                                        120
ctacagtctg catttggcag aaatgaagat gaatttggat taaatgagga tgctgaagat
                                                                        180
ttgcctcacc aaacaaaagt gaaacaactg agagaaaatt ttcaggaaaa aagacagtgg
                                                                        240
ctcttgaagt atcagtcact tttgagaatg tttcttagtt actgcatact tcatggatcc
                                                                        300
catggtgggg gtcttgcatc tgtaagaatg gaattgattt tgcttttgca agaatctcag
                                                                        360
caggaaacat cagaaccact attttctagc cctctgtcag agcaaacctc agtgcctctc
                                                                        420
ctctttgctt gt ,
                                                                        432
```

```
<210> 126
      <211> 112
      <212> DNA
      <213> Homo sapien
      <400> 126
acacaacttg aatagtaaaa tagaaactga gctgaaattt ctaattcact ttctaaccat
                                                                         60
agtaagaatg atatttcccc ccagggatca ccaaatattt ataaaaattt gt
                                                                        112
      <210> 127
      <211> 54
      <212> DNA
      <213> Homo sapien
      <400> 127
accacgaaac cacaaacaag atggaagcat caatccactt gccaagcaca gcag
                                                                         54
      <210> 128
      <211> 323
      <212> DNA .
      <213> Homo sapien
      <400> 128
acctcattag taattgtttt gttgtttcat ttttttctaa tgtctcccct ctaccagctc
                                                                         60
acctgagata acagaatgaa aatggaagga cagccagatt tctcctttgc tctctgctca
                                                                        120
ttctctctga agtctaggtt acccattttg gggacccatt ataggcaata aacacagttc
                                                                        180
ccaaagcatt tggacagttt cttgttgtgt tttagaatgg ttttcctttt tcttagcctt
                                                                        240
ttcctgcaaa aggeteacte agtecettge ttgeteagtg gaetgggete eecagggeet
                                                                        300
aggetgeett etttteeatg tee
                                                                        323
      <210> 129
      <211> 192
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(192)
      <223> n = A, T, C or G
      <400> 129
acatacatgt gtgtatattt ttaaatatca cttttgtatc actctgactt tttagcatac
                                                                         60
tgaaaacaca ctaacataat ttntgtgaac catgatcaga tacaacccaa atcattcatc
                                                                        120
tagcacattc atctgtgata naaagatagg tgagtttcat ttccttcacg ttggccaatg
                                                                        180
gataaacaaa gt
                                                                        192
      <210> 130
      <211> 362
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(362)
      <223> n = A, T, C \text{ or } G
      <400> 130
ccctttttta tggaatgagt agactgtatg tttgaanatt tanccacaac ctctttgaca
```

```
tataatgacg caacaaaaag gtgctgttta gtcctatggt tcagtttatg cccctgacaa
                                                                         120
gtttccattg tgttttgccg atcttctggc taatcgtggt atcctccatg ttattaqtaa
                                                                         180
ttctgtattc cattttgtta acgcctggta gatgtaacct gctangaggc taactttata
                                                                         240
cttatttaaa agctcttatt ttgtggtcat taaaatggca atttatgtgc agcactttat
                                                                         300
tgcagcagga agcacgtgtg ggttggttgt aaagctcttt gctaatctta aaaagtaatg
                                                                         360
                                                                         362
      <210> 131
      <211> 332
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(332)
      <223> n = A, T, C or G
      <400> 131
ctttttgaaa gatcgtgtcc actcctgtgg acatcttgtt ttaatggagt ttcccatgca
                                                                         60
gtangactgg tatggttgca gctgtccaga taaaaacatt tgaagagctc caaaatgaga
                                                                        120
gttctcccag gttcgccctg ctgctccaag tctcagcagc agcctctttt aggaggcatc
                                                                        180
ttctgaacta gattaaggca gcttgtaaat ctgatgtgat ttggtttatt atccaactaa
                                                                        240
cttccatctg ttatcactgg agaaagccca gactccccan gacnggtacg gattgtgggc
                                                                        300
atanaaggat tgggtgaagc tggcgttgtg gt
                                                                        332 .
      <210> 132
      <211> 322
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(322)
      \langle 223 \rangle n = A,T,C or G
      <400> 132
actititgcca tititgtatat ataaacaatc tigggacatt ciccigaaaa ciaggigtcc
                                                                         60
agtggctaag agaactcgat ttcaagcaat tctgaaagga aaaccagcat gacacagaat
                                                                        120
ctcaaattcc caaacagggg ctctgtggga aaaatgaggg aggacctttg tatctcgggt
                                                                        180
tttagcaagt taaaatgaan atgacaggaa aggcttattt atcaacaaag agaagagttg
                                                                        240
ggatgettet aaaaaaaact ttggtagaga aaataggaat getnaateet agggaageet
                                                                        300
gtaacaatct acaattggtc ca
                                                                        322
      <210> 133
      <211> 278
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(278)
      <223> n = A, T, C or G
      <400> 133
acaagcette acaagtttaa etaaattggg attaatettt etgtanttat etgeataatt
                                                                         60
cttgtttttc tttccatctg gctcctgggt tgacaatttg tggaaacaac tctattgcta
                                                                        120
ctatttaaaa aaaatcacaa atctttccct ttaagctatg ttnaattcaa actattcctg
                                                                        180
ctattcctgt tttgtcaaag aaattatatt tttcaaaata tgtntatttg tttgatgggt
                                                                        240
```

DESCRIPTION AND ANAMARA . .

```
cccacgaaac actaataaaa accacagaga ccagcctg.
                                                                          278
       <210> 134
       <211> 121
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature |
       <222> (1) ... (121)
       \langle 223 \rangle n = A,T,C or G
      <400> 134
gtttanaaaa cttgtttagc tccatagagg aaagaatgtt aaactttgta ttttaaaaca
                                                                           60
tgattctctg aggttaaact tggttttcaa atgttatttt tacttgtatt ttgcttttqq
                                                                          120
                                                                          121
      <210> 135
      <211> 350
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(350)
      \langle 223 \rangle n = A,T,C or G
      <400> 135
acttanaacc atgcctagca catcagaatc cctcaaagaa catcagtata atcctatacc
                                                                           60
atancaagtg gtgactggtt aagcgtgcga caaaggtcag ctggcacatt acttgtgtgc
                                                                          120
aaacttgata cttttgttct aagtaggaac tagtatacag tncctaggan tggtactcca
                                                                          180
gggtgcccc caactcctgc agccgctcct ctgtgccagn ccctgnaagg aactttcqct
                                                                         240
ccacctcaat caagecetgg gecatgetae etgeaattgg etgaacaaac gtttgetgag
                                                                         300
ttcccaagga tgcaaagcct ggtgctcaac tcctggggcg tcaactcagt
                                                                         350
      <210> 136
      <211> 399
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(399)
      \langle 223 \rangle n = A,T,C or G
      <400> 136
tgtaccgtga agacgacaga agttgcatgg cagggacagg gcagggccga ggccagggtt
                                                                          60
gctgtgattg tatccgaata ntcctcgtga gaaaagataa tgagatgacg tgagcagcct
                                                                         120
gcagacttgt gtctgccttc aanaagccag acaggaaggc cctgcctgcc ttggctctga
                                                                         180
cctggcggcc agccagccag ccacaggtgg gcttcttcct tttgtggtga caacnccaag
                                                                         240
aaaactgcag aggcccaggg tcaggtgtna gtgggtangt gaccataaaa caccaggtgc
                                                                         300
teccaggaac cegggeaaag gecateecea cetacageca geatgeecae tggegtgatg
                                                                         360
ggtgcagang gatgaagcag ccagntgttc tgctgtggt
                                                                         399
      <210> 137
      <211> 165
      <212> DNA
      <213> Homo sapien
```

```
<220>
       <221> misc feature
       <222> (1)...(165)
       <223> n = A,T,C or G
       <400> 137
 actggtgtgg tngggggtga tgctggtggt anaagttgan gtgacttcan gatggtgtgt
 ggaggaagtg tgtgaacgta gggatgtaga ngttttggcc gtgctaaatg agcttcgqqa
                                                                         120
 ttggctggtc ccactggtgg tcactgtcat tggtggggtt cctgt
                                                                         165
       <210> 138
       <211> 338
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1)...(338)
       \langle 223 \rangle n = A,T,C or G
       <400> 138
actcactgga atgccacatt cacaaçagaa tcagaggtct gtgaaaacat taatggctcc
                                                                         60
ttaacttctc cagtaagaat cagggacttg aaatggaaac gttaacagcc acatgcccaa
                                                                        120
tgctgggcag tctcccatgc cttccacagt gaaagggctt gagaaaaatc acatccaatg
                                                                        180
tcatgtgttt ccagccacac caaaaggtgc ttggggtgga gggctggggg catananggt
                                                                        240
cangecteag gaageeteaa gtteeattea getttgeeae tgtaeattee ceatntttaa
                                                                        300
aaaaactgat gccttttttt tttttttttg taaaattc
                                                                        338
      <210> 139
      <211> 382
      <212> DNA
      <213> Homo sapien
      <400> 139
gggaatcttg gtttttggca tctggtttgc ctatagccga ggccactttg acagaacaaa
                                                                         60
gaaagggact tcgagtaaga aggtgattta cagccagcct agtgcccgaa gtgaaggaga
                                                                        120
attcaaacag acctcgtcat tcctggtgtg agcctggtcg gctcaccgcc tatcatctgc
                                                                        180
atttgcctta ctcaggtgct accggactct ggcccctgat gtctgtagtt tcacaggatg
                                                                        240
cettatttgt ettetacace ceacagggee cectaettet teggatgtgt ttttaataat
                                                                        300
gtcagctatg tgccccatcc tccttcatgc cctccctccc tttcctacca ctgctgagtg
                                                                        360
gcctggaact tgtttaaagt gt
                                                                        382
      <210> 140
      <211> 200
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (200)
      <223> n = A,T,C or G
      <400> 140
accaaanctt ctttctgttg tgttngattt tactataggg gtttngcttn ttctaaanat
                                                                        60
actiticatt taacanctit tgttaagtgt caggetgeae titgeteeat anaattattg
                                                                       120
ttttcacatt tcaacttgta tgtgtttgtc tcttanagca ttggtgaaat cacatatttt
                                                                       180
atattcagca taaaggagaa
                                                                       200
```

DNCDOOID JUIC 012400242 1

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<210> 141
      <211> 335
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(335)
      \langle 223 \rangle n = A,T,C or G
      <400> 141
actttatttt caaaacactc atatgttgca aaaaacacat agaaaaataa agtttggtgg
                                                                         60
gggtgctgac taaacttcaa gtcacagact tttatgtgac agattggagc agggtttgtt
                                                                        120
atqcatqtaq aqaacccaaa ctaatttatt aaacaggata gaaacaggct gtctgggtga
                                                                        180
aatggttctg agaaccatcc aattcacctg tcagatgctg atanactagc tcttcagatg
                                                                        240
tttttctacc agttcagaga tnggttaatg actanttcca atggggaaaa agcaagatgg
                                                                        300
                                                                        335
attcacaaac caagtaattt taaacaaaga cactt
      <210> 142
      <211> 459
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(459)
      <223> n = A,T,C or G
      <400> 142
                                                                         60.
accaggttaa tattgccaca tatatccttt ccaattgcgg gctaaacaga cgtgtattta
gggttgttta aagacaaccc agcttaatat caagagaaat tgtgaccttt catggagtat
                                                                        120
ctgatggaga aaacactgag ttttgacaaa tcttatttta ttcagatagc agtctgatca
                                                                        180
cacatggtcc aacaacactc aaataataaa tcaaatatna tcagatgtta aagattggtc.
                                                                        240
ttcaaacatc atagccaatg atgccccgct tgcctataat ctctccgaca taaaaccaca
                                                                        300
tcaacacctc agtggccacc aaaccattca gcacagcttc cttaactgtg agctgtttga
                                                                        360
agctaccagt ctgagcacta ttgactatnt ttttcangct ctgaatagct ctagggatct
                                                                        420
                                                                        459
cagcangggt gggaggaacc agctcaacct tggcgtant
      <210> 143
      <211> 140
      <212> DNA
      <213> Homo sapien
      <400> 143
acattteett ceaceaagte aggaeteetg gettetgtgg gagttettat cacetgaggg
                                                                         60
                                                                        120
aaatccaaac aqteteteet aqaaaggaat agtgteacca accccaccca tetecetgag
accatecgae tteectgtgt
                                                                        140
      <210> 144
      <211> 164
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(164)
      \langle 223 \rangle n = A,T,C or G
```

```
<400> 144
acttcagtaa caacatacaa taacaacatt aagtgtatat tgccatcttt gtcattttct
                                                                         60
atctatacca ctctcccttc tgaaaacaan aatcactanc caatcactta tacaaatttg
                                                                        120
                                                                        164
aggcaattaa tccatatttg ttttcaataa ggaaaaaaaag atgt
     , <210> 145
      <211> 303
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (303)
      <223> n = A, T, C or G
      <400> 145
acgtagacca tccaactttg tatttgtaat ggcaaacatc cagnagcaat tcctaaacaa
                                                                         60
actggagggt atttataccc aattatccca ttcattaaca tgccctcctc ctcaggctat
                                                                        120
                                                                        180
gcaggacage tateataagt eggeecagge atecagatae taccatttgt ataaaettea
gtaggggagt ccatccaagt gacaggtcta atcaaaggag gaaatggaac ataagcccag
                                                                        240
tagtaaaatn ttgcttagct gaaacagcca caaaagactt accgccgtgg tgattaccat
                                                                        300
                                                                        303
caa
      <210> 146
      <211> 327
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(327)
      <223> n = A, T, C or G
      <400> 146
actgcagete aattagaagt ggtetetgae ttteateane tteteeetgg geteeatgae
                                                                         60
actggcctgg agtgactcat tgctctggtt ggttgagaga gctcctttgc caacaggcct
                                                                        120
ccaagtcagg gctgggattt gtttcctttc cacattctag caacaatatg ctggccactt
                                                                        180
cctgaacagg gagggtggga ggagccagca tggaacaagc tgccactttc taaagtagcc
                                                                        240
agacttgccc ctgggcctgt cacacctact gatgaccttc tgtgcctgca ggatggaatg
                                                                        300
                                                                        327
taggggtgag ctgtgtgact ctatggt
      <210> 147
      <211> 173
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(173)
      <223> n = A, T, C or G
      <400> 147 ·
acattgtttt tttgagataa agcattgana gagctctcct taacgtgaca caatggaagg
                                                                        60
actggaacac atacccacat ctttgttctg agggataatt ttctgataaa gtcttgctgt
                                                                       120
                                                                       173
atattcaagc acatatgtta tatattattc agttccatgt ttatagccta gtt
```

<210> 148

<212> DNA

```
<211> 477
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(477)
       <223> n = A,T,C or G
       <400> 148
acaaccactt tatctcatcg aatttttaac ccaaactcac tcactgtgcc tttctatcct
                                                                         60
atgggatata ttatttgatg ctccatttca tcacacatat atgaataata cactcatact
                                                                        120
gecetactae etgetgeaat aateacatte cetteetgte etgaceetga agecattggg
                                                                        180
gtggtcctag tggccatcag tccangcctg caccttgagc ccttgagctc cattgctcac
                                                                        240
nccancecae etcacegace ceatectett acacagetae etcettgete tetaacecea
                                                                        300
tagattatnt ccaaattcag tcaattaagt tactattaac actctacccg acatgtccag
                                                                        360
caccactggt aagcettete cagecaacae acacacaca acacneacae acacacatat
                                                                        420
ccaggcacag gctacctcat cttcacaatc acceptttaa ttaccatget atggtgg
                                                                        477
       <210> 149
       <211> 207
       <212> DNA
       <213> Homo sapien
       <400> 149
acagttgtat tataatatca agaaataaac ttgcaatgag agcatttaag agggaagaac
                                                                         60
taacgtattt tagagagcca aggaaggttt ctgtggggag tgggatgtaa ggtggggcct
                                                                        120
gatgataaat aagagtcagc caggtaagtg ggtggtgtgg tatgggcaca gtgaagaaca
                                                                        180
tttcaggcag agggaacagc agtgaaa
                                                                        207
      <210> 150
      <211> 111
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(111)
      <223> n = A,T,C or G
      <400> 150
accttgattt cattgctgct ctgatggaaa cccaactatc taatttagct aaaacatggg
                                                                        60
cacttaaatg tggtcagtgt ttggacttgt taactantgg catctttggg t
                                                                       111
      <210> 151
      <211> 196
      <212> DNA
      <213> Homo sapien
      <400> 151
agcgcggcag gtcatattga acattccaga tacctatcat tactcgatgc tgttgataac
                                                                        60
agcaagatgg ctttgaactc agggtcacca ccagctattg gaccttacta tgaaaaccat
                                                                       120
ggataccaac cggaaaaccc ctatcccgca cagcccactg tggtccccac tgtctacgag
                                                                       180
gtgcatccgg ctcagt
                                                                       196
      <210> 152
      <211> 132
```

<213> Homo sapien <400> 152 acagcacttt cacatgtaag aagggagaaa ttcctaaatg taggagaaag ataacagaac 60 120 cttccccttt tcatctagtg gtggaaacct gatgctttat gttgacagga atagaaccag 132 gagggagttt gt <210> 153 <211> 285 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> (1)...(285) <223> n = A, T, C or G<400> 153 acaanaccca nganaggcca ctggccgtgg tgtcatggcc tccaaacatg aaagtgtcag 60 cttctgctct tatgtcctca tctgacaact ctttaccatt tttatcctcg ctcagcagga 120 gcacatcaat aaagtccaaa gtcttggact tggccttggc ttggaggaag tcatcaacac 180 cctggctagt gagggtgcgg cgccgctcct ggatgacggc atctgtgaag tcgtgcacca 240 285 gtctgcaggc cctgtggaag cgccgtccac acggagtnag gaatt <210> 154 <211> 333 <212> DNA <213> Homo sapien <400> 154 accacagtee tgttgggeea gggetteatg accetttetg tgaaaageea tattateace 60 120 accccaaatt tttccttaaa tatctttaac tgaaggggtc agcctcttga ctgcaaagac 180 cctaagccgg ttacacagct aactcccact ggccctgatt tgtgaaattg ctgctgcctg 240 attggcacag gagtcgaagg tgttcagctc ccctcctccg tggaacgaga ctctgatttg agtttcacaa attctcgggc cacctcgtca ttgctcctct gaaataaaat ccggagaatg 300 333 gtcaggcctg tctcatccat atggatcttc cgg <210> 155 <211> 308 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> (1)...(308) <223> n = A, T, C or G<400> 155 60 actggaaata ataaaaccca catcacagtg ttgtgtcaaa gatcatcagg gcatggatgg 120 gaaagtgett tgggaaetgt aaagtgeeta acacatgate gatgattttt gttataatat 180 ttgaatcacg gtgcatacaa actetectge etgetectee tgggeeccag ecceagecee 240 atcacagete aetgetetgt teatecagge ecageatgta gtggetgatt ettettgget gettttagee tecanaagtt tetetgaage caaccaaace tetangtgta aggeatgetg 300 308 gccctggt <210> 156

<211> 295 <212> DNA

480

```
<213> Homo sapien
       <400> 156
 accttgctcg gtgcttggaa catattagga actcaaaata tgagatgata acagtgccta
                                                                          60
 ttattgatta ctgagagaac tgttagacat ttagttgaag attttctaca caggaactga
                                                                         120
 gaataggaga ttatgtttgg ccctcatatt ctctcctatc ctccttgcct cattctatgt
                                                                         180
 ctaatatatt ctcaatcaaa taaggttagc ataatcagga aatcgaccaa ataccaatat
                                                                         240
 aaaaccagat gtctatcctt aagattttca aatagaaaac aaattaacaq actat
                                                                         295
       <210> 157
       <211> 126
       <212> DNA
       <213> Homo sapien
       <400> 157
acaagtttaa atagtgetgt cactgtgeat gtgetgaaat gtgaaateca ecacatttet
                                                                          60
gaagagcaaa acaaattctg tcatgtaatc tctatcttgg gtcgtgggta tatctgtccc
                                                                         120
cttagt
                                                                         126
       <210> 158
       <211> 442
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (442)
      <223> n = A, T, C \text{ or } G
      <400> 158
acccactggt cttggaaaca cccatcctta atacgatgat ttttctgtcg tgtgaaaatg
                                                                          60
aanccagcag gctgccccta gtcagtcctt ccttccagag aaaaagagat ttgagaaagt
                                                                         120
gcctgggtaa ttcaccatta atttcctccc ccaaactctc tgagtcttcc cttaatattt
                                                                         180
ctggtggttc tgaccaaagc aggtcatggt ttgttgagca tttggggatcc cagtgaagta
                                                                       : 240
natgtttgta gccttgcata cttagccctt cccacgcaca aacggagtgg cagagtggtg
                                                                         300
ccaaccctgt tttcccagtc cacgtagaca gattcacagt gcggaattct ggaagctgga
                                                                         360
nacagaeggg etetttgeag ageegggaet etgagangga eatgagggee tetgeetetg
                                                                         420
tgttcattct ctgatgtcct gt
                                                                         442
      <210> 159
      <211> 498
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(498)
      \langle 223 \rangle n = A,T,C or G
      <400> 159
acttccaggt aacgttgttg tttccgttga gcctgaactg atgggtgacg ttgtaggttc
                                                                         60
tccaacaaga actgaggttg cagagcgggt agggaagagt gctgttccag ttgcacctgg
                                                                        120
gctgctgtgg actgttgttg attcctcact acggcccaag gttgtggaac tggcanaaag
                                                                        180
gtgtgttgtt gganttgage tegggegget gtggtaggtt gtgggetett caacagggge
                                                                        240
tgctgtggtg ccgggangtg aangtgttgt gtcacttgag cttggccagc tctggaaagt
                                                                        300
antanattet teetgaagge cagegettgt ggagetggea ngggteantg ttgtgtgtaa
                                                                        360
cgaaccagtg ctgctgtggg tgggtgtana tcctccacaa agcctgaagt tatggtgtcn
                                                                        420
```

tcaggtaana atgtggtttc agtgtccctg ggcngctgtg gaaggttgta nattgtcacc

BNGDOCID- MO 013480343 1 -

aagggaataa gctgtggt	498
<210> 160	
<211> 380	
<212> DNA	
<213> Homo sapien	
<220>	
<221> misc_feature	
<222> (1)(380)	
$\langle 223 \rangle$ n = A,T,C or G	
<400> 160	
acctgcatcc agcttccctg ccaaactcac aaggagacat caacctctag acagggaaac	60
agetteagga taetteeagg agacagagee accageagea aaacaaatat teecatgeet	120
ggagcatggc atagaggaag ctganaaatg tggggtctga ggaagccatt tgagtctggc	180
cactagacat ctcatcagcc acttgtgtga agagatgccc catgacccca gatgcctctc	240
ccaccettac etccatetca cacacttgag etttecacte tgtataatte taacateetg	300
gagaaaaatg gcagtttgac cgaacctgtt cacaacggta gaggctgatt tctaacgaaa cttgtagaat gaagcctgga	360 380
<210> 161	
<211> 114	
<212> DNA	
<213> Homo sapien	
<400> 161	
actecacate ecetetgage aggeggttgt egtteaaggt gtatttggee ttgeetgtea	60
cactgtccac tggcccctta tccacttggt gcttaatccc tcgaaagagc atgt	114
<210> 162	
<211> 177	
<212> DNA	
<213> Homo sapien	
<400> 162	
actitictgaa togaatcaaa tgatacttag tgtagtttta atatoctcat atatatcaaa	60
gttttactac tctgataatt ttgtaaacca ggtaaccaga acatccagtc atacagcttt	120
tggtgatata taacttggca ataacccagt ctggtgàtac ataaaactac tcactgt	177
<210> 163	
<211> 137	
<212> DNA	
<213> Homo sapien	
<220>	
<221> misc_feature	
<222> (1)(137)	
$\langle 223 \rangle$ n = A,T,C or G	
<400> 163	<b>~</b> ^
catttataca gacaggegtg aagacattca egacaaaaac gegaaattet atecegtgac	60
canagaagge agetaegget actectaeat cetggegtgg gtggeetteg eetgeaeett eateagegge atgatgt	120 137
	1 C 1
<210> 164	
<211> 469	

DEICHOCID- AND DARABOORD I .

```
<213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(469)
       <223> n = A, T, C or G
       <400> 164
 cttatcacaa tgaatgttct cctgggcagc gttgtgatct ttgccacctt cgtgacttta
                                                                          60
 tgcaatgcat catgctattt catacctaat gagggagttc caggagattc aaccaggaaa
                                                                         120
 tgcatggatc tcaaaggaaa caaacaccca ataaactcgg agtggcagac tgacaactgt
                                                                         180
 gagacatgca cttgctacga aacagaaatt tcatgttgca cccttgtttc tacacctgtg
                                                                        240
ggttatgaca aagacaactg ccaaagaatc ttcaagaagg aggactgcaa gtatatcgtg
                                                                         300
gtggagaaga aggacccaaa aaagacctgt tctgtcagtg aatggataat ctaatgtgct
                                                                         360
 tetagtagge acagggetee caggecagge eteattetee tetggeetet aatagteaat
                                                                         420
gattgtgtag ccatgcctat cagtaaaaag atntttgagc aaacacttt
                                                                         469
       <210> 165
       <211> 195
       <212> DNA
       <213> Homo sapien
       <220>
      <221> misc_feature
      <222> (1)...(195)
       <223> n = A, T, C or G
      <400> 165
acagtttttt atanatatcg acattgccgg cacttgtgtt cagtttcata aagctggtgg
                                                                         -60
atcogctgtc atcoactatt cottggctag agtaaaaatt attottatag cocatgtocc
                                                                        120
tgcaggccgc ccgcccgtag ttctcgttcc agtcgtcttg gcacacaggg tgccaggact
                                                                        180
tcctctgaga tgagt
                                                                        195
      <210> 166
      <211> 383
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(383)
      <223> n = A, T, C or G
      <400> 166
acatettagt agtgtggcae atcaggggge cateagggte acagteacte atageetege
                                                                         60
cgaggtcgga gtccacacca ccggtgtagg tgtgctcaat cttgggcttg gcgcccacct
                                                                        120
ttggagaagg gatatgctgc acacacatgt ccacaaagcc tgtgaactcg ccaaagaatt
                                                                        180
tttgcagacc agcctgagca aggggcggat gttcagcttc agctcctcct tcgtcaggtg
                                                                        240
gatgccaacc tcgtctangg tccgtgggaa gctggtgtcc acntcaccta caacctgggc
                                                                        300
gangatetta taaagagget eenagataaa etecaegaaa ettetetggg agetgetagt
                                                                        360
nggggccttt ttggtgaact ttc
                                                                        383
      <210> 167
      <211> 247
      <212> DNA
      <213> Homo sapien
      <220>
```

```
<221> misc feature
      <222> (1)...(247)
      <223> n = A, T, C or G
      <400> 167
acagagecag acettggeca taaatgaane agagattaag actaaacece aagteganat
                                                                         60
tggagcagaa actggagcaa gaagtgggcc tggggctgaa gtagagacca aggccactgc
                                                                        120
tatanccata cacagageca acteteagge caaggenatg gttggggeag anceagagae
                                                                        180
tcaatctgan tccaaagtgg tggctggaac actggtcatg acanaggcag tgactctgac
                                                                        240
tgangtc
                                                                        247
      <210> 168
      <211> 273
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(273)
      <223> n = A,T,C or G
      <400> 168
acttctaagt tttctagaag tggaaggatt gtantcatcc tgaaaatggg tttacttcaa
                                                                        60
aatccctcan ccttgttctt cacnactgtc tatactgana gtgtcatgtt tccacaaagg
                                                                        120
gctgacacct gagcctgnat tttcactcat ccctgagaag ccctttccag tagggtgggc
                                                                        180
aatteccaac tteettgeca caagetteee aggetttete eeetggaaaa eteeagettg
                                                                        240
agtcccagat acactcatgg gctgccctgg gca
                                                                        273
      <210> 169
      <211> 431
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(431)
      <223> n = A, T, C or G
      <400> 169
acagoettgg ettececaaa etecaeagte teagtgeaga aagateatet tecageagte
                                                                        60
agctcagacc agggtcaaag gatgtgacat caacagtttc tggtttcaga acaggttcta
                                                                       120
ctactgtcaa atgaccccc atacttcctc aaaggctgtg gtaagttttg cacaggtgag
                                                                       180
ggcagcagaa agggggtant tactgatgga caccatcttc tctgtatact ccacactgac
                                                                       240
cttgccatgg gcaaaggccc ctaccacaaa aacaatagga tcactgctgg gcaccagctc
                                                                       300
acgcacatca ctgacaaccg ggatggaaaa agaantgcca actttcatac atccaactgg
                                                                       360
aaagtgatct gatactggat tcttaattac cttcaaaagc ttctgggggc catcagctgc
                                                                       420
tcgaacactg a
                                                                       431
      <210> 170
      <211> 266
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(266)
      <223> n = A,T,C or G
```

```
<400>. 170
acctgtgggc tgggctgtta tgcctgtgcc ggctgctgaa agggagttca gaggtggagc
                                                                       60
tcaaggagct ctgcaggcat tttgccaanc ctctccanag canagggagc aacctacact
                                                                      120
ccccgctaga aagacaccag attggagtcc tgggaggggg agttggggtg ggcatttgat
                                                                      180
gtatacttgt cacctgaatg aangagccag agaggaanga gacgaanatg anattggcct
                                                                      240
tcaaagctag gggtctggca ggtgga
                                                                      266
      <210> 171
      <211> 1248
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(1248)
      \langle 223 \rangle n = A,T,C or G
      <400> 171
ggcagccaaa tcataaacgg cgaggactgc agcccgcact cgcagccctg gcaggcggca
                                                                       60
ctggtcatgg aaaacgaatt gttctgctcg ggcgtcctgg tgcatccgca gtgggtgctg
                                                                      120
teageegeae aetgttteea gaagtgagtg cagageteet acaceategg getgggeetg
                                                                      180
cacagtettg aggecgaeca agagecaggg agecagatgg tggaggecag ceteteegta
                                                                      240
eggeacecag agtacaacag accettgete getaacgace teatgeteat caagttggae
                                                                      300
gaatccgtgt ccgagtctga caccatccgg agcatcagca ttgcttcgca gtgccctacc
                                                                      360
geggggaact cttgcctcgt ttctggctgg ggtctgctgg cgaacggcag aatgcctacc
                                                                      420
gtgctgcagt gcgtgaacgt gtcggtggtg tctgaggagg tctgcagtaa gctctatgac
                                                                      480
ccgctgtacc accccagcat gttctgcgcc ggcggagggc aagaccagaa ggactcctgc
                                                                      540
aacggtgact ctggggggcc cctgatctgc aacgggtact tgcagggcct tgtgtctttc
                                                                      600
ggaaaageec egtgtggeea aqttggegtg ceaggtgtet acaecaacet etgeaaatte
                                                                      660
actgagtgga tagagaaaac cgtccaggcc agttaactct ggggactggg aacccatqaa
                                                                      720
attgaccccc aaatacatcc tgcggaagga attcaggaat atctgttccc agcccctcct
                                                                      780
ccctcaggcc caggagtcca ggccccagc ccctcctccc tcaaaccaag ggtacagatc
                                                                      840
cccagcccct cctccctcag acccaggagt ccagacccc cagcccctcc tccctcagac
                                                                      900
ccaggagtcc agcccctcct ccctcagacc caggagtcca gaccccccag cccctcctcc
                                                                      960
ctcagaccca ggggtccagg cccccaaccc ctcctccctc agactcagag gtccaagccc
                                                                     1020
ccaaccente attecceaga eccagaggte caggteccag eccetentee etcagaceca
                                                                     1080
geggteeaat geeacetaga etnteeetgt acacagtgee eeettgtgge aegttgaeee
                                                                     1140
aaccttacca gttggttttt catttttngt ccctttcccc tagatccaga aataaagttt
                                                                     1200
1248
      <210> 172
      <211> 159
      <212> PRT
      <213> Homo sapien
      <220>
      <221> VARIANT
      <222> (1)...(159)
      <223> Xaa = Any Amino Acid
      <400> 172
Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro
1
Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser
Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr
                            40
Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly
```

```
Arg Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu
                    70
Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe
                                    90
Cys. Ala Gly Gly Gln Xaa Gln Xaa Asp Ser Cys Asn Gly Asp Ser
                                105
                                                    110
Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe
                            120
                                                125
Gly Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn
                                            140
                        135
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
145
      <210> 173
```

<210> 173

<211> 1265

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(1265)

 $\langle 223 \rangle$  n = A,T,C or G

· <400> 173

ggcagecege actegeagec etggcaggeg geactggtea tggaaaacga attgttetge 60 tegggegtee tggtgeatee geagtgggtg etgteageeg caeactgttt ecagaactee 120 tacaccateg ggetgggeet geacagtett gaggeegace aagageeagg gageeagatg 180 gtggaggeca geeteteegt acqqcaecca gagtacaaca gaccettqet egetaacqae 240 ctcatgctca tcaagttgga cqaatccgtg tccgagtctg acaccatccg gagcatcagc 300 attgcttcgc agtgccctac cgcggggaac tcttgcctcg tttctggctg gggtctgctg 360 gcgaacggtg agctcacggg tgtgtgtctg ccctcttcaa ggaggtcctc tgcccagtcg 420 cgggggctga cccagagctc tgcgtcccag gcagaatgcc taccgtgctg cagtgcgtga 480 acgtgtcggt ggtgtctgag gaggtctgca gtaagctcta tgacccgctg taccacccca 540 geatgttetg egeeggegga gggeaagaee agaaggaete etgeaaeggt gaetetgggg 600 ggcccctgat ctgcaacggg tacttgcagg gccttgtgtc tttcggaaaa gccccgtgtg 660 gccaagttgg cgtgccaggt gtctacacca acctctgcaa attcactgag tggatagaga 720 aaaccgtcca ggccagttaa ctctggggac tgggaaccca tgaaattgac ccccaaatac 780 atectgegga aggaatteag gaatatetgt teecageece teeteeetea ggeecaggag 840 tecaggeece cageceetee teecteaaac caagggtaca gateeceage eecteeteec 900 teagacecag gagtecagae eccecagece etectecete agacecagga gtecagecee 960 tecteentea gacceaggag tecagacece ceagececte eteceteaga eccaggggtt 1020 gaggeeecca acceetecte etteagagte agaggteeaa geeeccaaec cetegtteec 1080 cagacccaga ggtnnaggtc ccagccctc ttccntcaga cccagnggtc caatgccacc 1140 tagattttcc ctgnacacag tgcccccttg tggnangttg acccaacctt accagttggt 1200 1260 ttttcatttt tngtcccttt cccctagatc cagaaataaa gtttaagaga ngngcaaaaa aaaaa 1265

<210> 174

<211> 1459

<212> DNA

<213> Homo sapien

<220>

<221> misc\_feature

<222> (1)...(1459)

 $\langle 223 \rangle$  n = A,T,C or G

1167

```
<400> 174
ggtcagccgc acactgtttc cagaagtgag tgcagagctc ctacaccatc gggctgggcc
                                                                         60
tgcacagtct tgaggccgac caagagccag ggagccagat ggtggaggcc agcctctccg
                                                                        120
tacggcaccc agagtacaac agaccettge tegetaacga ceteatgete atcaagttgg
                                                                        180
acgaatccgt gtccgagtct gacaccatcc ggagcatcag cattgcttcg cagtgcccta
                                                                        240
ccgcggggaa ctcttgcctc gtttctggct ggggtctgct ggcgaacggt gagctcacgg
                                                                        300
gtgtgtgtct gccctcttca aggaggtcct ctgcccagtc gcgggggctg acccagagct
                                                                        360
ctgcgtccca ggcagaatgc ctaccgtgct gcagtgcgtg aacgtgtcgg tggtgtctga
                                                                        420
ngaggtctgc antaagctct atgacccgct gtaccacccc ancatgttct gcgccggcgg
                                                                        480
agggcaagac cagaaggact cctgcaacgt gagagaggg aaaggggagg gcaggcgact
                                                                        540
cagggaaggg tggagaaggg ggagacagag acacacaggg ccgcatggcg agatgcagag
                                                                        600
atggagagac acacagggag acagtgacaa ctagagagag aaactgagag aaacagagaa
                                                                        660
ataaacacag gaataaagag aagcaaagga agagagaaac agaaacagac atggggaggc
                                                                        720
agaaacacac acacatagaa atgcagttga ccttccaaca gcatggggcc tgagggcggt
                                                                        780
gacctccacc caatagaaaa tcctcttata acttttgact ccccaaaaac ctgactagaa
                                                                        840
atagcctact gttgacgggg agccttacca ataacataaa tagtcgattt atgcatacgt
                                                                        900
tttatgcatt catgatatac ctttgttgga attttttgat atttctaagc tacacagttc
                                                                        960
gtctgtgaat ttttttaaat tgttgcaact ctcctaaaat ttttctgatg tgtttattga
                                                                       1020
aaaaatccaa gtataagtgg acttgtgcat tcaaaccagg gttgttcaag ggtcaactgt
                                                                       1080
gtacccagag ggaaacagtg acacagattc atagaggtga aacacgaaga gaaacaggaa
                                                                       1140
aaatcaagac tctacaaaga ggctgggcag ggtggctcat gcctgtaatc ccagcacttt
                                                                       1200
gggaggcgag gcaggcagat cacttgaggt aaggagttca agaccagcct ggccaaaatg
                                                                       1260
gtgaaatcct gtctgtacta aaaatacaaa agttagctgg atatggtggc aggcgcctgt
                                                                       1320
aatcccagct acttgggagg ctgaggcagg agaattgctt gaatatggga ggcagaggtt
                                                                       1380
gaagtgagtt gagatcacac cactatactc cagctggggc aacagagtaa gactctgtct
                                                                       1440
caaaaaaaa aaaaaaaaa
                                                                       1459
      <210> 175
      <211> 1167
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(1167)
      \langle 223 \rangle n = A,T,C or G
      <400> 175
gegeageest ggeaggegge actggteatg gaaaacgaat tgttetgete gggegteetg
                                                                        60
gtgcatccgc agtgggtgct gtcagccgca cactgtttcc agaactccta caccatcggg
                                                                       120
ctgggcctgc acagtcttga ggccgaccaa gagccaggga gccagatggt ggaggccagc
                                                                       180
ctctccgtac ggcacccaga gtacaacaga ctcttgctcg ctaacgacct catgctcatc
                                                                       240
aagttggacg aatcegtgte egagtetgae accateegga geateageat tgettegeag
                                                                       300
tgccctaccg cggggaacte ttgcctcgtn tctggctggg gtctgctggc gaacggcaga
                                                                       360
atgcctaccg tgctgcactg cgtgaacgtg tcggtggtgt ctgaggangt ctgcagtaag
                                                                       420
ctctatgacc cgctgtacca ccccagcatg ttctgcgccg gcggagggca agaccagaag
                                                                       480
gacteetgea aeggtgaete tggggggeee etgatetgea aegggtaett geagggeett
                                                                       540
gtgtctttcg gaaaagcccc gtgtggccaa cttggcgtgc caggtgtcta caccaacctc
                                                                       600
tgcaaattca ctgagtggat agagaaaacc gtccagncca gttaactctg gggactggga
                                                                       660
acccatgaaa ttgaccccca aatacatcct gcggaangaa ttcaggaata tctgttccca
                                                                       720
geocetecte ceteaggeee aggagteeag geocecagee cetectecet caaaccaagg
                                                                       780
gtacagatec ecageceete eteceteaga eccaggagte cagacecece ageceetent
                                                                       840
centeagace caggagteca gecetecte enteagacge aggagtecag accececage
                                                                       900
cententeeg teagaceeag gggtgeagge ecceaaceee tenteentea gagteagagg
                                                                       960
tccaagcccc caacccctcg ttccccagac ccagaggtnc aggtcccagc ccctcctccc
                                                                      1020
tcagacccag cggtccaatg ccacctagan tntccctgta cacagtgccc ccttgtggca
                                                                      1080
ngttgaccca accttaccag ttggtttttc attttttgtc cctttcccct agatccagaa
                                                                      1140
ataaagtnta agagaagcgc aaaaaaa
```

<210> 176

```
<211> 205
       <212> PRT
       <213> Homo sapien
       <220>
       <221> VARIANT
       <222> (1)...(205)
       <223> Xaa = Any Amino Acid
       <400> 176
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
                                     10
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                 25
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
                             40
 Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Leu Leu Leu
                         55
                                             60
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
                     70
                                         75
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
                 85
                                     90
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met
             100
                                 105
Pro Thr Val Leu His Cys Val Asn Val Ser Val Val Ser Glu Xaa Val
                             120
Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys Ala
                         135
                                             140
Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly
                     150
                                         155
Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys
                                     170
Ala Pro Cys Gly Gln Leu Gly Val Pro Gly Val Tyr Thr Asn Leu Cys
                                 185
Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Xaa Ser
        195
                            200
      <210> 177
      <211> 1119
      <212> DNA
      <213> Homo sapien
      <400> 177
gcgcactcgc agccctggca ggcggcactg gtcatggaaa acgaattgtt ctgctcgggc
                                                                         60
gtcctggtgc atccgcagtg ggtgctgtca gccgcacact gtttccagaa ctcctacacc
                                                                        120
atcgggctgg gcctgcacag tcttgaggcc gaccaagagc cagggagcca gatggtggag
                                                                       180
gccagcctct ccgtacggca cccagagtac aacagaccct tgctcgctaa cgacctcatg
                                                                       240
ctcatcaagt tggacgaatc cgtgtccgag tctgacacca tccggagcat cagcattgct
                                                                       300
tegeagtgee ctacegeggg gaactettge etegtttetg getggggtet getggegaae
                                                                       360
gatgetgtga ttgecateca gteceagaet gtgggagget gggagtgtga gaagetttee
                                                                       420
caaccetgge agggttgtac cattteggea actteeagtg caaggaegte etgetgeate
                                                                       480
ctcactgggt getcactact getcactgca tcacceggaa cactgtgate aactagecag
                                                                       540
caccatagtt ctccgaagtc agactatcat gattactgtg ttgactgtgc tgtctattgt
                                                                       600
actaaccatg ccgatgttta ggtgaaatta gcgtcacttg gcctcaacca tcttggtatc
                                                                       660
cagttatect cactgaattg agattteetg etteagtgte agecatteec acataattte
                                                                       720
tgacctacag aggtgaggga tcatatagct cttcaaggat gctggtactc ccctcacaaa
                                                                       780
```

```
ttcatttctc ctgttgtagt gaaaggtgcg ccctctggag cctcccaggg tgggtgtgca
                                                                        840
ggtcacaatg atgaatgtat gatcgtgttc ccattaccca aagcctttaa atccctcatg
                                                                        900
ctcagtacac cagggcaggt ctagcatttc ttcatttagt gtatgctgtc cattcatgca
                                                                        960
accaceteag gacteetgga ttetetgeet agttgagete etgeatgetg eeteettggg .
                                                                       1020
gaggtgaggg agagggccca tggttcaatg ggatctgtgc agttgtaaca cattaggtgc
                                                                       1080
ttaataaaca gaagetgtga tgttaaaaaa aaaaaaaaa
                                                                       1119
      <210> 178
      <211> 164
      <212> PRT
      <213> Homo sapien
      <220>
      <221> VARIANT
      <222> (1)...(164)
      <223> Xaa = Any Amino Acid
      <400> 178
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
                                     10
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val
                             40
Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Asp Ala Val .
                                 105
Ile Ala Ile Gln Ser Kaa Thr Val Gly Gly Trp Glu Cys Glu Lys Leu
                             120
Ser Gln Pro Trp Gln Gly Cys Thr Ile Ser Ala Thr Ser Ser Ala Arg
                        135
                                             140
Thr Ser Cys Cys Ile Leu Thr Gly Cys Ser Leu Leu Leu Thr Ala Ser
                    150
                                         155
                                                             160
Pro Gly Thr Leu
      <210> 179
      <211> 250
      <212> DNA
      <213> Homo sapien
      <400> 179
ctggagtgcc ttggtgtttc aagcccctgc aggaagcaga atgcaccttc tgaggcacct
                                                                        60
ccagctgccc ccggccgggg gatgcgaggc tcggagcacc cttgcccggc tgtgattgct
                                                                       120
gccaggcact gttcatctca gcttttctgt ccctttgctc ccggcaagcg cttctgctga
                                                                       180
aagttcatat ctggagcctg atgtcttaac gaataaaggt cccatgctcc acccgaaaaa
                                                                       240
aaaaaaaaa
                                                                       250
```

<210> 180 <211> 202 <212> DNA

<213> Homo sapien

240

```
<400> 180
actagtocag tgtggtggaa ttccattgtg ttgggcccaa cacaatggct acctttaaca
                                                                         60
teacceagae ecegeceetg ecegtgeece aegetgetge taacgacagt atgatgetta
                                                                        120
ctctgctact cggaaactat ttttatgtaa ttaatgtatg ctttcttgtt tataaatgcc
                                                                        180
tgatttaaaa aaaaaaaaaa aa
                                                                        202
      <210> 181
      <211> 558
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(558)
      <223> n = A, T, C or G
      <400> 181
tccytttgkt naggtttkkg agacamccck agacctwaan ctgtgtcaca gacttcyngg
                                                                        60
aatgtttagg cagtgctagt aatttcytcg taatgattct gttattactt tcctnattct
                                                                       120
ttattcctct ttcttctgaa gattaatgaa gttgaaaatt gaggtggata aatacaaaaa
                                                                       180
ggtagtgtga tagtataagt atctaagtgc agatgaaagt gtgttatata tatccattca
                                                                       240
aaattatgca agttagtaat tactcagggt taactaaatt actttaatat gctgttgaac
                                                                       300
ctactctgtt ccttggctag aaaaaattat aaacaggact ttgttagttt gggaagccaa
                                                                       360
attgataata ttctatgttc taaaagttgg gctatacata aattattaag aaatatggaw
                                                                       420
ttttattccc aggaatatgg kgttcatttt atgaatatta cscrggatag awgtwtgagt
                                                                       480
aaaaycagtt ttggtwaata ygtwaatatg tcmtaaataa acaakgcttt gacttatttc.
                                                                       540
caaaaaaaa aaaaaaaa
                                                                       558
      <210> 182
      <211> 479
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(479)
      <223> n = A,T,C or G
      <400> 182
acagggwttk grggatgcta agsccccrga rwtygtttga tccaaccctg gcttwttttc
                                                                        60
agaggggaaa atggggccta gaagttacag mscatytagy tggtgcgmtg gcacccctgg
                                                                       120
cstcacacag astcccgagt agctgggact acaggcacac agtcactgaa gcaggccctg
                                                                       180
ttwgcaattc acgttgccac ctccaactta aacattcttc atatgtgatg tccttagtca
                                                                       240
ctaaggttaa actttcccac ccagaaaagg caacttagat aaaatcttag agtactttca
                                                                       300
tactmttcta agtectette cageeteact kkgagteetm cytgggggtt gataggaant
                                                                       360
ntctcttggc tttctcaata aartctctat ycatctcatg tttaatttgg tacgcatara
                                                                       420
awtgstgara aaattaaaat gttctggtty mactttaaaa araaaaaaaa aaaaaaaaa
                                                                       479
      <210> 183
      <211> 384
      <212> DNA
      <213> Homo sapien
     <400> 183
aggcgggagc agaagctaaa gccaaagccc aagaagagtg gcagtgccag cactggtgcc
                                                                        60
agtaccagta ccaataacag tgccagtgcc agtgccagca ccagtggtgg cttcagtgct
                                                                       120
ggtgccagcc tgaccgccac tctcacattt gggctcttcg ctggccttgg tggagctggt
                                                                       180
```

gccagcacca gtggcagete tggtgcetgt ggttteteet acaagtgaga ttttagatat

```
tgttaatcct gccagtcttt ctcttcaagc cagggtgcat cctcagaaac ctactcaaca
                                                                        300
cagcacteta ggcagecaet atcaatcaat tgaagttgae actetgeatt aratetattt
                                                                        360
gccatttcaa aaaaaaaaaa aaaa
                                                                        384
      <210> 184
      <211> 496
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(496)
      <223> n = A,T,C or G
      <400> 184
accgaattgg gaccgctgqc ttataaqcqa tcatqtyynt ccrqtatkac ctcaacqaqc
                                                                        60
agggagateg agtetatacg etgaaqaaat ttqaccegat gggacaacag acetgetcag
                                                                       120
cccatcctgc teggttetec ccagatgaca aatactetsg acaccgaatc accatcaaga
                                                                       180
aacgettcaa ggtgetcatg acceageaac egegeeetgt eetetgaggg teeettaaac
                                                                       240
tgatgtcttt tctgccacct gttacccctc ggagactccg taaccaaact cttcggactg
                                                                       300
tgagccctga tgcctttttg ccagccatac tctttggcat ccagtctctc gtggcgattg
                                                                       360
attatgettg tgtgaggeaa teatggtgge ateaceeata aagggaacae atttgaettt
                                                                       420
tttttctcat attttaaatt actacmagaw tattwmagaw waaatgawtt gaaaaactst
                                                                       480
taaaaaaaa aaaaaa
                                                                       496
      <210> 185
      <211> 384
      <212> DNA
      <213> Homo sapien
      <400> 185
gctggtagcc tatggcgkgg cccacggagg ggctcctgag gccacggrac agtgacttcc
                                                                        60
caagtatcyt gegesgegte ttetacegte cetacetgea gatetteggg cagatteece
                                                                       120
aggaggacat ggacgtggcc ctcatggagc acagcaactg ytcgtcggag cccggcttct
                                                                       180
gggcacaccc tectggggec caggegggea cetgegtete ceagtatgec aactggetgg
                                                                       240
tggtgctgct cctcgtcatc ttcctgctcg tggccaacat cctgctggtc aacttgctca
                                                                       300
ttgccatgtt cagttacaca ttcggcaaag tacagggcaa cagcgatctc tactgggaag
                                                                       360
gcgcagcgtt accgcctcat ccgg
                                                                       384
      <210> 186
      <211> 577
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(577)
      <223> n = A, T, C or G
      <400> 186
gagttagete etceacaace ttgatgaggt egtetgeagt ggeetetege tteatacege
                                                                        60
tnccategte atactgtagg tttgccacca cytectggca tettggggeg gentaatatt
                                                                       120
ccaggaaact ctcaatcaag tcaccgtcga tgaaacctgt gggctggttc tgtcttccgc
                                                                       180
teggtgtgaa aggatetece agaaggagtg etegatette eccaeaettt tgatgaettt
                                                                       240
attgagtcga ttctgcatgt ccagcaggag gttgtaccag ctctctgaca gtgaggtcac
                                                                       300
cagccctatc atgccgttga mcgtgccgaa garcaccgag ccttgtgtgg gggkkgaagt
                                                                       360
ctcacccaga ttctgcatta ccagagagcc gtggcaaaag acattgacaa actcgcccag
                                                                       420
gtggaaaaag amcamctect ggargtgetn geegeteete gtemgttggt ggeagegetw
                                                                       480
```

```
tecttttgac acacaaacaa gttaaaggca ttttcagccc ccagaaantt gtcatcatcc
                                                                         540
 aagatntcgc acagcactna tccagttggg attaaat
                                                                         577
       <210> 187
       <211> 534
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1)...(534)
       <223> n = A, T, C or G
      <400> 187
aacatcttcc tgtataatgc tgtgtaatat cgatccgatn ttgtctgstg agaatycatw
                                                                         60
actkggaaaa gmaacattaa agcctggaca ctggtattaa aattcacaat atgcaacact
                                                                        120
ttaaacagtg tgtcaatctg ctcccyynac tttgtcatca ccagtctggg aakaagggta
                                                                        180
tgccctattc acacctgtta aaagggcgct aagcattttt gattcaacat ctttttttt
                                                                        240
gacacaagtc cgaaaaaagc aaaagtaaac agttatyaat ttgttagcca attcactttc
                                                                        300
ttcatgggac agagccatyt gatttaaaaa gcaaattgca taatattgag cttygggagc
                                                                        360
tgatatttga gcggaagagt agcctttcta cttcaccaga cacaactccc tttcatattg
                                                                        420
ggatgttnac naaagtwatg tetetwacag atgggatget tttgtggcaa ttetgttetg
aggatetece agtitatita ecaetigeae aagaaggegt titetteete agge
      <210> 188
      <211> 761
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(761)
      \langle 223 \rangle n = A,T,C or G
      <400> 188
agaaaccagt atctctnaaa acaacctctc ataccttgtg gacctaattt tgtgtgcgtg
                                                                         60
tgtgtgtgcg cgcatattat atagacaggc acatcttttt tacttttgta aaagcttatg
                                                                       . 120
cctctttggt atctatatct gtgaaagttt taatgatctg ccataatgtc ttggggacct
                                                                        180
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt
                                                                        240
tttattcgac atgaaggaaa tttccagatn acaacactna caaactctcc ctkgackarg
                                                                        300
ggggacaaag aaaagcaaaa ctgamcataa raaacaatwa cctggtgaga arttgcataa
                                                                        360
acagaaatwr ggtagtatat tgaarnacag catcattaaa rmgttwtktt wttctccctt
                                                                        420
gcaaaaaaca tgtacngact tcccgttgag taatgccaag ttgtttttt tatnataaaa
                                                                        480
cttgcccttc attacatgtt tnaaagtggt gtggtgggcc aaaatattga aatgatggaa
                                                                        540
ctgactgata aagctgtaca aataagcagt gtgcctaaca agcaacacag taatgttgac
                                                                        600
atgcttaatt cacaaatgct aatttcatta taaatgtttg ctaaaataca ctttgaacta
                                                                       660
tttttctgtn ttcccagagc tgagatntta gattttatgt agtatnaagt gaaaaantac
                                                                       720
gaaaataata acattgaaga aaaananaaa aaanaaaaaa a
                                                                       761
      <210> 189
      <211> 482
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(482)
      <223> n = A,T,C or G
```

```
<400> 189
                                                                         60
tttttttttt tttgccgatn ctactatttt attgcaggan gtgggggtgt atgcaccgca
                                                                        120
caccggggct atnagaagca agaaggaagg agggagggca cagccccttg ctgagcaaca
aageegeetg etgeettete tgtetgtete etggtgeagg eacatgggga gacetteeee
                                                                        180
aaggcagggg ccaccagtcc aggggtggga atacaggggg tgggangtgt gcataagaag
                                                                        240
tgataggcac aggccacccg gtacagaccc ctcggctcct gacaggtnga tttcgaccag
                                                                        300
gtcattgtgc cctgcccagg cacagcgtan atctggaaaa gacagaatgc tttccttttc
                                                                        360
aaatttggct ngtcatngaa ngggcanttt tccaanttng gctnggtctt ggtacncttg
                                                                        420
gttcggccca gctccncgtc caaaaantat tcacccnnct ccnaattgct tgcnggnccc
                                                                        480
CC
                                                                        482
      <210> 190
      <211> 471
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (471).
      \langle 223 \rangle n = A,T,C or G
      <400> 190
tttttttttt ttttaaaaca gtttttcaca acaaaattta ttagaagaat agtggttttg
                                                                         60
aaaactctcg catccagtga gaactaccat acaccacatt acagctngga atgtnctcca
                                                                        120
aatgtctggt caaatgatac aatggaacca ttcaatctta cacatgcacg aaagaacaag
                                                                        180
cgcttttgac atacaatgca caaaaaaaa agggggggg gaccacatgg attaaaattt
                                                                        2.40
taagtactca tcacatacat taagacacag ttctagtcca gtcnaaaatc agaactgcnt
                                                                        300
tgaaaaattt catgtatgca atccaaccaa agaacttnat tggtgatcat gantnctcta
                                                                        360
ctacatcnac cttgatcatt gccaggaacn aaaagttnaa ancacncngt acaaaaanaa
                                                                        420
                                                                        471
tctgtaattn anttcaacct ccgtacngaa aaatnttnnt tatacactcc c
      <210> 191
      <211> 402
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(402)
      \langle 223 \rangle n = A,T,C or G
      <400> 191
gagggattga aggtetgtte tastgteggm etgtteagee aceaacteta acaagttget
                                                                         60
gtettecaet caetgtetgt aagettttta acceagaewg tatetteata aatagaacaa
                                                                        120
attetteace agteacatet tetaggaeet ttttggatte agttagtata agetetteea
                                                                        180
ctteetttgt taagaettea tetggtaaag tettaagttt tgtagaaagg aattyaattg
                                                                        240
ctcgttctct aacaatgtcc tctccttgaa gtatttggct gaacaaccca cctaaagtcc
                                                                        300
ctttgtgcat ccattttaaa tatacttaat agggcattgk tncactaggt taaattctgc
                                                                        360
aagagtcatc tgtctgcaaa agttgcgtta gtatatctgc ca
                                                                        402
      <210> 192
      <211> 601
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
```

<222> (1)...(601)

```
<223> n = A, T, C or G
       <400> 192
 gageteggat ecaataatet ttgtetgagg geageacaea tatneagtge catggnaact
                                                                          60
 ggtctacccc acatgggagc agcatgccgt agntatataa ggtcattccc tgagtcagac
                                                                         120
 atgcytyttt gaytaccgtg tgccaagtgc tggtgattct yaacacacyt ccatcccgyt
                                                                         180
 cttttgtgga aaaactggca cttktctgga actagcarga catcacttac aaattcaccc
                                                                         240
 acgagacact tgaaaggtgt aacaaagcga ytcttgcatt gctttttgtc cctccggcac
                                                                         300
 cagttgtcaa tactaacccg ctggtttgcc tccatcacat ttgtgatctg tagctctgga
                                                                         360
 tacateteet gacagtactg aagaaettet tettttgttt caaaageare tettggtgee
                                                                         420
 tgttggatca ggttcccatt tcccagtcyg aatgttcaca tggcatattt wacttcccac
                                                                         480
 aaaacattgc gatttgaggc tcagcaacag caaatcctgt tccggcattg gctgcaagag
                                                                         540
 cctcgatgta gccggccagc gccaaggcag gcgccgtgag ccccaccagc agcagaagca
                                                                         600
                                                                         601
       <210> 193
       <211> 608
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(608)
       <223> n = A, T, C or G
       <400> 193
atacagecca nateccaeca egaagatgeg ettgttgaet gagaacetga tgeggteaet
                                                                         60
ggtcccgctg tagccccagc gactctccac ctgctggaag cggttgatgc tgcactcytt
                                                                        120
cccaacgcag gcagmagcgg gsccggtcaa tgaactccay tcgtggcttg gggtkgacgg
                                                                        180
tkaagtgcag gaagaggctg accacctcgc ggtccaccag gatgcccgac tgtgcgggac
                                                                        240
ctgcagcgaa actcctcgat ggtcatgagc gggaagcgaa tgaggcccag ggccttgccc
                                                                        300
agaacettee geetgttete tggegteace tgeagetget geegetgaea eteggeeteg
                                                                        360
gaccagegga caaaeggert tgaacageeg caeeteaegg atgeecagtg tgtegegete
                                                                        420
caggammgsc accagegtgt ccaggtcaat gteggtgaag cccteegegg gtratggegt
                                                                        480
ctgcagtgtt tttgtcgatg ttctccaggc acaggctggc cagctgcggt tcatcgaaga
                                                                        540
gtcgcgcctg cgtgagcagc atgaaggcgt tgtcggctcg cagttcttct tcaggaactc
                                                                        600
cacgcaat
                                                                        608
      <210> 194
      <211> 392
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(392)
      <223> n = A, T, C or G
      <400> 194
gaacggctgg accttgcctc gcattgtgct tgctggcagg gaataccttg gcaagcagyt
                                                                        60
ccagtecgag cageeccaga cegetgeege cegaagetaa geetgeetet ggeetteece
                                                                       120
tccgcctcaa tgcagaacca gtagtgggag cactgtgttt agagttaaga gtgaacactg
                                                                       180
tttgatttta cttgggaatt tcctctgtta tatagctttt cccaatgcta atttccaaac
                                                                       240
aacaacaaca aaataacatg tttgcctgtt aagttgtata aaagtaggtg attctgtatt
                                                                       300
taaagaaaat attactgtta catatactgc ttgcaatttc tgtatttatt gkinctstgg
                                                                       360
aaataaatat agttattaaa ggttgtcant cc
                                                                       392
```

```
<210> 195
      <211> 502
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(502)
      <223> n = A, T, C or G
      <400> 195
ccsttkgagg ggtkaggkyc cagttyccga gtggaagaaa caggccagga gaagtgcgtg
                                                                      60
ccgagctgag gcagatgttc ccacagtgac ccccagagcc stgggstata gtytctgacc
                                                                       120
cctcncaagg aaagaccacs ttctggggac atgggctgga gggcaggacc tagaggcacc
                                                                       180
aagggaaggc cccattccgg ggstgttccc cgaggaggaa gggaaggggc tctgtgtgcc
                                                                       240
ccccasgagg aagaggccct gagtcctggg atcagacacc ccttcacgtg tatcccaca
                                                                       300
caaatgcaag ctcaccaagg teceetetea gteeeettee stacaccetg ameggeeact
                                                                       360
gscscacacc cacccagagc acgccacccg ccatggggar tgtgctcaag gartcgcngg
                                                                       420
gcarcgtgga catcingico cagaaggggg cagaatotoo aatagangga cigarcmsti
                                                                       480
                                                                       502
gctnanaaaa aaaaanaaaa aa
      <210> 196
      <211> 665
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(665)
      <223> n = A, T, C \text{ or } G
      <400> 196
ggttacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc
cctctggaag ccttgcgcag agcggacttt gtaattgttg gagaataact gctgaatttt
                                                                       120
wagctgtttk gagttgatts gcaccactgc acccacaact tcaatatgaa aacyawttga
                                                                       180
actwatttat tatcttgtga aaagtataac aatgaaaatt ttgttcatac tgtattkatc
                                                                       240
aagtatgatg aaaagcaawa gatatatatt cttttattat gttaaattat gattgccatt
                                                                       300
attaatcggc aaaatgtgga gtgtatgttc ttttcacagt aatatatgcc ttttgtaact
                                                                       360
                                                                       420
tcacttqqtt attttattqt aaatgartta caaaattctt aatttaagar aatggtatgt
                                                                       480
watatttatt tcattaattt ctttcctkgt ttacgtwaat tttgaaaaga wtgcatgatt
                                                                       540
tettgacaga aateqatett gatgetgtgg aagtagtttg acceacatee etatgagttt
ttcttagaat gtataaaggt tgtagcccat cnaacttcaa agaaaaaaat gaccacatac
                                                                       600
                                                                       660
tttgcaatca ggctgaaatg tggcatgctn ttctaattcc aactttataa actagcaaan
                                                                       665
aagtg
      <210> 197
      <211> 492
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(492)
      <223> n = A,T,C or G
      <400> 197
ttttnttttt tttttttgc aggaaggatt ccatttattg tggatgcatt ttcacaatat
                                                                        60
atgtttattg gagcgatcca ttatcagtga aaagtatcaa gtgtttataa natttttagg
                                                                       120
```

```
aaggcagatt cacagaacat gctngtcngc ttgcagtttt acctcgtana gatnacagag
                                                                          180
 aattatagtc naaccagtaa acnaggaatt tacttttcaa aagattaaat ccaaactgaa
                                                                          240
 caaaattcta ccctgaaact tactccatcc aaatattgga ataanagtca gcagtgatac
                                                                          300
 attetettet gaaetttaga ttttetagaa aaatatgtaa tagtgateag gaagagetet
                                                                         360
 tgttcaaaag tacaacnaag caatgttccc ttaccatagg ccttaattca aactttgatc
                                                                         420
 catttcactc ccatcacggg agtcaatgct acctgggaca cttgtatttt gttcatnctg
                                                                         480
 ancntggctt aa
                                                                         492
       <210> 198
       <211> 478
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(478)
       <223> n = A,T,C or G
       <400> 198
 tttnttttgn atttcantct gtannaanta ttttcattat gtttattana aaaatatnaa
                                                                          60
 tgtntccacn acaaatcatn ttacntnagt aagaggccan ctacattgta caacatacac
                                                                         120
tgagtatatt ttgaaaagga caagtttaaa gtanacncat attgccganc atancacatt
                                                                         180
tatacatggc ttgattgata tttagcacag canaaactga gtgagttacc agaaanaaat
                                                                         240
natatatgtc aatcngattt aagatacaaa acagatccta tggtacatan catcntgtag
                                                                         300
gagttgtggc tttatgttta ctgaaagtca atgcagttcc tgtacaaaga gatggccgta
                                                                        360
agcattctag tacctctact ccatggttaa gaatcgtaca cttatgttta catatgtnca
                                                                        420
gggtaagaat tgtgttaagt naanttatgg agaggteean gagaaaaatt tgatneaa
      <210> 199
      <211> 482
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(482)
      \langle 223 \rangle n = A,T,C or G
      <400> 199
agtgacttgt cetecaacaa aaceeettga teaagtttgt ggcactgaca atcagaceta :
                                                                         60
tgctagttcc tgtcatctat tcgctactaa atgcagactg gaggggacca aaaaggggca
                                                                        120
tcaactccag ctggattatt ttggagcctg caaatctatt cctacttgta cggactttga
                                                                        180
agtgattcag tttcctctac ggatgagaga ctggctcaag aatatcctca tgcagcttta
                                                                        240
tgaagccnac tetgaacacg etggttatet nagatgagaa neagagaaat aaagtenaga
                                                                        300
aaatttacct ggangaaaag aggetttngg etggggacca teecattgaa eettetetta
                                                                        360
anggacttta agaanaaact accacatgtn tgtngtatcc tggtgccngg ccgtttantg
                                                                        420
aacntngaen neaccettnt ggaatanant ettgaengen teetgaaett geteetetge
                                                                        480
qa
                                                                        482
      <210> 200
      <211> 270
      <212> DNA
      <213> Homo sapien
     <220>
     <221> misc_feature
     <222> (1)...(270)
     <223> n = A, T, C or G
```

```
<400> 200
cggccgcaag tgcaactcca gctggggccg tgcggacgaa gattctgcca gcagttggtc
                                                                      60
cgactgcgac gacggcggcg gcgacagtcg caggtgcagc gcgggcgcct ggggtcttgc
                                                                     120
aaggetgage tgacgeegea gaggtegtgt caegteecae gacettgaeg eegtegggga
                                                                     180
cagccggaac agagcccggt gaangcggga ggcctcgggg agcccctcgg gaagggcggc
                                                                     240
                                                                     270
ccgagagata cgcaggtgca ggtggccgcc
     <210> 201
     <211> 419
      <212> DNA
      <213> Homo sapien
     <220>
     <221> misc_feature
      <222> (1)...(419)
      <223> n = A, T, C or G
      <400> 201
                                                                      60
ttttttttt ttttggaatc tactgcgagc acagcaggtc agcaacaagt ttattttgca
gctagcaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg
                                                                     120
                                                                     180
ttgattggtt tgtctttatg ggggcggggt ggggtagggg aaancgaagc anaantaaca
tggagtgggt gcaccetece tgtagaacet ggttacnaaa gettggggca gttcacetgg
                                                                     240
tctgtgaccg tcattttctt gacatcaatg ttattagaag tcaggatatc ttttagagag
                                                                     300
tccactgtnt ctggagggag attagggttt cttgccaana tccaancaaa atccacntga
                                                                     360
aaaagttgga tgatncangt acngaatacc ganggcatan ttctcatant cggtggcca
                                                                     419
      <210> 202
     <211> 509
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(509)
      <223> n = A, T, C or G
      <400> 202
60
tggcacttaa tccattttta tttcaaaatg tctacaaant ttnaatncnc cattatacng
                                                                     120
                                                                     180
gtnattttnc aaaatctaaa nnttattcaa atntnagcca aantccttac ncaaatnnaa
                                                                     240
tacnencaaa aateaaaaat atacntntet tteageaaac ttngttacat aaattaaaaa
aatatatacg gctggtgttt tcaaagtaca attatcttaa cactgcaaac atntttnnaa
                                                                     300
                                                                     360
ggaactaaaa taaaaaaaa cactnccgca aaggttaaag ggaacaacaa attcntttta
caacancnnc nattataaaa atcatatctc aaatcttagg ggaatatata éttcacacng
                                                                     420
ggatcttaac ttttactnca ctttgtttat ttttttanaa ccattgtntt gggcccaaca
                                                                     480
                                                                     509
caatggnaat nccnccncnc tggactagt
      <210> 203
      <211> 583
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(583)
      \langle 223 \rangle n = A,T,C or G
```

```
<400> 203
                                                                         60
ttttttttt ttttttga ccccctctt ataaaaaaca agttaccatt ttattttact
                                                                        120
tacacatatt tattttataa ttggtattag atattcaaaa ggcagctttt aaaatcaaac
taaatggaaa ctgccttaga tacataattc ttaggaatta gcttaaaatc tgcctaaagt
                                                                        180
gaaaatcttc tctagctctt ttgactgtaa atttttgact cttgtaaaac atccaaattc
                                                                        240
attittcttg totttaaaat tatotaatot ticcattitt tooctaticc aagtoaattt
                                                                        300
gettetetag ceteatttee tagetettat etaetattag taagtggett tttteetaaa
                                                                        360
agggaaaaca ggaagagana atggcacaca aaacaaacat tttatattca tatttctacc
                                                                        420
tacgttaata aaatagcatt ttgtgaagcc agctcaaaag aaggcttaga tccttttatg
                                                                        480
tccattttag tcactaaacg atatcnaaag tgccagaatg caaaaggttt gtgaacattt
                                                                        540
attcaaaagc taatataaga tatttcacat actcatcttt ctg
                                                                        583
      <210> 204
      <211> 589
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(589)
      <223> n = A,T,C or G
      <400> 204
                                                                        60
tttttttttt tttttttt ttttttnctc ttctttttt ttganaatga ggatcgagtt
tttcactctc tagatagggc atgaagaaaa ctcatctttc cagctttaaa ataacaatca
                                                                       120
                                                                       180
aatetettat getatateat attttaagtt aaactaatga gteactgget tatettetee
tgaaggaaat ctgttcattc ttctcattca tatagttata tcaagtacta ccttgcatat
                                                                       240
tgagaggttt ttcttctcta tttacacata tatttccatg tgaatttgta tcaaaccttt
                                                                       300
attttcatgc aaactagaaa ataatgtntt cttttgcata agagaagaga acaatatnag
                                                                       360
cattacaaaa ctgctcaaat tgtttgttaa gnttatccat tataattagt tnggcaggag
                                                                       420
ctaatacaaa tcacatttac ngacnagcaa taataaaact gaagtaccag ttaaatatcc
                                                                       480
aaaataatta aaggaacatt tttagcctgg gtataattag ctaattcact ttacaagcat
                                                                       540
ttattnagaa tgaattcaca tgttattatt ccntagccca acacaatgg
                                                                       589
      <210> 205
      <211> 545
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(545)
      \langle 223 \rangle n = A,T,C or G
      <400> 205
tttttttttt tttttcagt aataatcaga acaatattta tttttatatt taaaattcat
                                                                        60
                                                                       120
agaaaagtgc cttacattta ataaaagttt gtttctcaaa gtgatcagag gaattagata
                                                                       180
tngtcttgaa caccaatatt aatttgagga aaatacacca aaatacatta agtaaattat
ttaagatcat agagettgta agtgaaaaga taaaatttga cetcagaaac tetgageatt
                                                                       240
aaaaatccac tattaqcaaa taaattacta tggacttctt gctttaattt tgtgatgaat
                                                                       300
atggggtgtc actggtaaac caacacattc tgaaggatac attacttagt gatagattct
                                                                       360
tatgtacttt gctanatnac gtggatatga gttgacaagt ttctctttct tcaatctttt
                                                                       420
aaggggcnga ngaaatgagg aagaaaagaa aaggattacg catactgttc tttctatngg
                                                                       480
aaggattaga tatgtttcct ttgccaatat taaaaaaata ataatgttta ctactagtga
                                                                       540
                                                                       545
aaccc
```

<210> 206 <211> 487

```
<212> DNA
       <213> Homo sapien
       <220>
       <221> misc feature
       <222> (1)...(487)
       \langle 223 \rangle n = A,T,C or G
       <400> 206
 ttttttttt ttttttagtc aagtttctna tttttattat aattaaagtc ttggtcattt
                                                                         60
 catttattag ctctgcaact tacatattta aattaaagaa acgttnttag acaactgtna
                                                                        120
 caatttataa atgtaaggtg ccattattga gtanatatat tcctccaaga gtggatgtgt
                                                                       : 180
 cccttctccc accaactaat gaancagcaa cattagttta attttattag tagatnatac
                                                                        240
 actgctgcaa acgctaattc tcttctccat ccccatgtng atattgtgta tatgtgtgag
                                                                        300
 ttggtnagaa tgcatcanca atctnacaat caacagcaag atgaagctag gcntgggctt
                                                                        360
 tcggtgaaaa tagactgtgt ctgtctgaat caaatgatct gacctatcct cggtggcaag
                                                                        420
aactettega acegetteet caaaggenge tgecacattt gtggentetn ttgcacttgt
                                                                        480
ttcaaaa
                                                                        487
       <210> 207
       <211> 332
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(332)
      <223> n = A,T,C or G
      <400> 207
tgaattggct aaaagactgc atttttanaa ctagcaactc ttatttcttt cctttaaaaa
                                                                         60
tacatagcat taaatcccaa atcctattta aagacctgac agcttgagaa ggtcactact
                                                                        120
gcatttatag gaccttctgg tggttctgct gttacntttg aantctgaca atccttgana
                                                                        180
atctttgcat gcagaggagg taaaaggtat tggattttca cagaggaana acacagcgca
                                                                        240
gaaatgaagg ggccaggctt actgagcttg tccactggag ggctcatggg tgggacatgg
                                                                        300
aaaagaaggc agcctaggcc ctggggagcc ca
                                                                        332
      <210> 208
      <211> 524
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(524)
      <223> n = A,T,C or G
      <400> 208
agggcgtggt gcggagggcg ttactgtttt gtctcagtaa caataaatac aaaaagactg
                                                                        60
gttgtgttcc ggccccatcc aaccacgaag ttgatttctc ttgtgtgcag agtgactgat
                                                                       120
tttaaaggac atggagcttg tcacaatgtc acaatgtcac agtgtgaagg gcacactcac
                                                                       180
tecegegtga tteacattta geaaceaaca atageteatg agteeatact tgtaaatact
                                                                       240
tttggcagaa tacttnttga aacttgcaga tgataactaa gatccaagat atttcccaaa
                                                                       300
gtaaatagaa gtgggtcata atattaatta cctgttcaca tcagcttcca tttacaagtc
                                                                       360
atgageceag acaetgaeat caaactaage ceaettagae teetcaecae cagtetgtee
                                                                       420
tgtcatcaga caggaggetg tcacettgac caaattetca ecagtcaate atetatecaa
                                                                       480
aaaccattac ctgatccact tccggtaatg caccaccttg gtga
                                                                       524
```

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<210> 209
       <211> 159
       <212> DNA
       <213> Homo sapien
       <400> 209
gggtgaggaa atccagagtt gccatggaga aaattccagt gtcagcattc ttgctccttq
                                                                          60
tggccctctc ctacactctg gccagagata ccacagtcaa acctggagcc aaaaaggaca
                                                                         120
caaaggactc tcgacccaaa ctgccccaga ccctctcca
                                                                         159
       <210> 210
      <211> 256
      <212> DNA
       <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(256)
      <223> n = A, T, C or G
      <400> 210
actccctggc agacaaaggc agaggagaga gctctgttag ttctgtgttg ttgaactgcc
                                                                          60
actgaatttc tttccacttg gactattaca tgccanttga gggactaatg gaaaaacgta
                                                                         120
tggggagatt ttanccaatt tangtntgta aatggggaga ctggggcagg cgggagagat
                                                                         180
ttgcagggtg naaatgggan ggctggtttg ttanatgaac agggacatag gaggtaggca
                                                                         240
ccaggatgct aaatca
                                                                         256
      <210> 211
      <211> 264
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(264)
      <223> n = A,T,C or G
      <400> 211
acattgtttt tttgagataa agcattgaga gagctctcct taacgtgaca caatggaagg
                                                                         60
actggaacac atacccacat ctttgttctg agggataatt ttctgataaa gtcttgctgt
                                                                        120
atattcaagc acatatgtta tatattattc agttccatgt ttatagccta gttaaggaga
                                                                        180
ggggagatac attcngaaag aggactgaaa gaaatactca agtnggaaaa cagaaaaaga
                                                                        240
aaaaaaggag caaatgagaa gcct
                                                                        264
      <210> 212
      <211> 328
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(328)
      \langle 223 \rangle n = A,T,C or G
      <400> 212
acccaaaat ccaatgetga atatttgget teattattee canattettt gattgteaaa
                                                                         60
ggatttaatg ttgtctcagc ttgggcactt cagttaggac ctaaggatgc cagccggcag
                                                                        120
gtttatatat gcagcaacaa tattcaagcg cgacaacagg ttattgaact tgcccgccag
                                                                        180
```

```
ttnaatttca ttcccattga cttgggatcc ttatcatcag ccagagagat tgaaaattta
                                                                         240
cccctacnac tetttactet etgganaggg ccagtggtgg tagetataag ettggccaca
                                                                         300
ttttttttc ctttattcct ttgtcaga
                                                                         328
       <210> 213
       <211> 250
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(250)
      <223> n = A, T, C or G
      <400> 213
acttatgage agagegaeat atcenagtgt agaetgaata aaaetgaatt eteteeagtt
                                                                          60
taaagcattg ctcactgaag ggatagaagt gactgccagg agggaaagta agccaaggct
                                                                         120
cattatgcca aagganatat acatttcaat totocaaact tottcctcat tocaagagtt
                                                                         180
ttcaatattt gcatgaacct gctgataanc catgttaana aacaaatatc tctctnacct
                                                                         240
tctcatcggt
                                                                         250
      <210> 214
      <211> 444
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) . . . (444)
      <223> n = A, T, C or G
      <400> 214
acccagaatc caatgctgaa tatttggctt cattattccc agattctttg attgtcaaag
                                                                         60
gatttaatgt tgtctcagct tgggcacttc agttaggacc taaggatgcc agccggcagg
                                                                        120
tttatatatg cagcaacaat attcaagcgc gacaacaggt tattgaactt gcccgccagt
                                                                        180
tgaatttcat tcccattgac ttgggatcct tatcatcagc canagagatt gaaaatttac
                                                                        240
ecctaegaet etttaetete tggagaggge eagtggtggt agetataage ttggeeacat
                                                                        300
ttttttttcc tttattcctt tgtcagagat gcgattcatc catatgctan aaaccaacag
                                                                        360
agtgactttt acaaaattcc tataganatt gtgaataaaa ccttacctat agttgccatt
                                                                        420
actttgctct ccctaatata cctc
                                                                        444
      <210> 215
      <211> 366
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(366)
      \langle 223 \rangle n = A,T,C or G
      <400> 215
acttatgage agagegaeat atceaagtgt anactgaata aaactgaatt etetecagtt
                                                                         60
taaagcattg ctcactgaag ggatagaagt gactgccagg agggaaagta agccaaggct
                                                                        120
cattatgcca aagganatat acatttcaat tctccaaact tcttcctcat tccaagagtt
                                                                        180
ttcaatattt gcatgaacct gctgataagc catgttgaga aacaaatatc tctctgacct
                                                                        240
teteateggt aageagagge tgtaggeaac atggaceata gegaanaaaa aacttagtaa
                                                                        300
tccaagctgt tttctacact gtaaccaggt ttccaaccaa ggtggaaatc tcctatactt
                                                                        360
```

```
ggtgcc
                                                                         366
        <210> 216
        <211> 260
        <212> DNA
        <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(260)
       <223> n = A,T,C or G
       <400> 216
 ctgtataaac agaactccac tgcangaggg agggccgggc caggagaatc tccgcttgtc
                                                                          60
 caagacaggg gcctaaggag ggtctccaca ctgctnntaa gggctnttnc attttttat
                                                                         120
 taataaaaag tnnaaaaggc ctcttctcaa cttttttccc ttnggctgga aaatttaaaa
                                                                         180
 atcaaaaatt teetnaagtt nteaagetat catatataet ntateetgaa aaageaacat
                                                                         240
 aattetteet teettett
                                                                        260
       <210> 217
       <211> 262
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(262)
       <223> n = A,T,C or G
       <400> 217
acctacgtgg gtaagtttan aaatgttata atttcaggaa naggaacgca tataattgta
                                                                         60
tettgeetat aattttetat tttaataagg aaatageaaa ttggggtggg gggaatgtag
                                                                        120
ggcattctac agtttgagca aaatgcaatt aaatgtggaa ggacagcact gaaaaatttt
                                                                        180
atgaataate tgtatgatta tatgteteta gagtagattt ataattagee aettaceeta
                                                                        240
atateettea tgettgtaaa gt
                                                                        262
      <210> 218
      <211> 205
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(205)
      <223> n = A,T,C or G
      <400> 218
accaaggtgg tgcattaccg gaantggatc aangacacca tcgtggccaa cccctgagca
                                                                        60
cccctatcaa ctcccttttg tagtaaactt ggaaccttgg aaatgaccag gccaagactc
                                                                       120
aggeeteece agttetactg acetttgtee ttangtntna ngtecagggt tgetaggaaa
                                                                       180
anaaatcagc agacacaggt gtaaa
                                                                       205
      <210> 219
      <211> 114
      <212> DNA
      <213> Homo sapien
     <400> 219
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tactgttttg tctcagtaac aataaataca a accacgaagt tgatttctct tgtgtgcaga (	aaaagactgg gtgactgatt	ttaaaggaca	gccccatcca tgga	114
<210> 220				
<211> 93				
<212> DNA				
<213> Homo sapien				
<400> 220			attattta	60
actagecage acaaaaggea gggtageetg	aattgettte	tgetetttae	accidicta	93
aaataagcat ttagtgctca gtccctactg	agc		•	;
<210> 221				
<211> 167				
<212> DNA				
<213> Homo sapien				
<220>				
<221> misc_feature				
<222> (1)(167) <223> n = A,T,C or G				
(223) II = A,1,C OI G	-			
<400> 221			ttaastasaa	60
actangtgca ggtgcgcaca aatatttgtc tettttgccc agcetgtggc tetactgtag	gatattccct	ctatcttgga	accagnatac	120
ccccactac ettecetgac getececana	aatcacccaa	cctctgt	gccagnacgc	167
ecceptatiat ettectigat getectama		,		
<210> 222				
<211> 351				•
<212> DNA <213> Homo sapien	•			
(213) Nomo Sapien				
<400> 222		2002100211	otagaacccc	60
agggcgtggt gcggagggcg gtactgacct gttcttcacc tgtcccccaa tccttaaaag	gccatactgc	ataaagtcaa	caacagataa	120
atgtttgctg aattaaagga tggatgaaaa	aaattaataa	tgaatttttg	cataatccaa	180
ttttctcttt tatatttcta gaagaagttt	ctttgagcct	attagatccc	gggaatcttt	240
taggtgagca tgattagaga gcttgtaggt	tgcttttaca	tatatctggc	atatttgagt	300
ctcgtatcaa aacaatagat tggtaaaggt	ggtattattg	tattgataag	t	351
<210> 223		•		
<211> 383				
<212> DNA				
<213> Homo sapien				
<220>				
<221> misc feature				
<222> (1) (383)				
<223> n = A, T, C  or  G				
<400> 223				
aaaacaaaca aacaaaaaaa acaattcttc	attcagaaaa	attatcttag	ggactgatat	60
togtaattat ggtcaattta atwrtrttkt	ggggcatttc	cttacattgt	cttgacaaga	120
ttaaaatgtc tgtgccaaaa ttttgtattt	tatttggaga	cttcttatca	aaagtaatgc	180 240
tgccaaagga agtctaagga attagtagtg	ttcccmtcac	ctttagtag	ggaaanagtt	300
taaaagattt tgatttcctg gaatgacaat ataggaccac agtcttcact tctgatactt	otaaattaat	cttttattgc	acttotttto	360
accattaagc tatatgttta aaa	3			383

```
<210> 224
      <211> 320
      <212> DNA
      <213> Homo sapien
      <400> 224
cccctgaagg cttcttgtta gaaaatagta cagttacaac caataggaac aacaaaaaga
                                                                      60
aaaagtttgt gacattgtag tagggagtgt gtacccctta ctccccatca aaaaaaaaat
                                                                     120
ggatacatgg ttaaaggata raagggcaat attttatcat atgttctaaa agagaaggaa
                                                                     180
gagaaaatac tactttctcr aaatggaagc ccttaaaggt gctttgatac tgaaggacac
                                                                     240
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gtggcctctc ggcctggtta gcaagaacat tcagggtagg cctaagttan tcgtgttagt t  <210> 257 .	240 300 301

240

```
gtcacattac tecetteagt gatttettgt agaagtgeca atecetgaat gecaceaaga
                                                                         300
tottaatott cacatottta atottatoto titgactoot otttacacog gagaaggoto
                                                                         301
      <210> 258
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 258
cagcagtagt agatgccgta tgccagcacg cccagcactc ccaggatcag caccagcacc
                                                                         60
aggggcccag ccaccaggcg cagaagcaag ataaacagta ggctcaagac cagagccacc
                                                                        120
cccagggcaa caagaatcca ataccaggac tgggcaaaat cttcaaagat cttaacactg
                                                                        180
atgtctcggg cattgaggct gtcaataana cgctgatccc ctgctgtatg gtggtgtcat
                                                                        240
tggtgatece tgggagegee ggtggagtaa egttggteea tggaaageag egeecacaae
                                                                        300
                                                                        301
      <210> 259
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 259
teatatatge aaacaaatge agactangee teaggeagag actaaaggae atetettggg
                                                                         60
gtgtcctgaa gtgatttgga cccctgaggg cagacaccta agtaggaatc ccagtgggaa
                                                                        120
gcaaagccat aaggaagccc aggattcctt gtgatcagga agtgggccag gaaggtctgt
                                                                        180
tecageteae ateteatetg catgeageae ggaceggatg egeceaetgg gtettggett
                                                                        240
coctcocate tteteaagea gtgteettgt tgagecattt geateettgg etceaggtgg
                                                                        300
                                                                        301
      <210> 260
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 260
tttttttttt ccctaaggaa aaagaaggaa caagtctcat aaaaccaaat aagcaatggt
                                                                         60
aaggtgtctt aacttgaaaa agattaggag tcactggttt acaagttata attgaatgaa
                                                                        120
agaactgtaa cagccacagt tggccatttc atgccaatgg cagcaaacaa caggattaac,
                                                                        180
                                                                        240
tagggcaaaa taaataagtg tgtggaagcc ctgataagtg cttaataaac agactgattc
actgagacat cagtacetge eegggeggee getegageeg aattetgeag atatecatea
                                                                        300
                                                                        301
      <210> 261
      <211> 301
      <212> DNA
      <213> Homo sapien
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<400> 261
aaatattega geaaateetg taaetaatgt gteteeataa aaggetttga aeteagtgaa
                                                                         60
tetgetteca tecaegatte tageaatgae eteteggaea teaaagetee tettaaggtt
                                                                        120
agcaccaact attccataca attcatcagc aggaaataaa ggctcttcag aaggttcaat
                                                                        180
ggtgacatcc aatttcttct gataatttag attcctcaca accttcctag ttaagtgaag
                                                                        240
ggcatgatga tcatccaaag cccagtggtc acttactcca gactttctgc aatgaagatc
                                                                        300
                                                                        301
      <210> 262
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 262
gaggagagec tgttacagca tttgtaagca cagaatactc caggagtatt tgtaattgtc
                                                                         60
tgtgagette ttgccgcaag tetetcagaa atttaaaaag atgcaaatee etgagtcace
                                                                        120
cctagacttc ctaaaccaga tcctctgggg ctggaacctg gcactctgca tttgtaatga
                                                                        180
gggctttctg gtgcacacct aattttgtgc atctttgccc taaatcctgg attagtgccc
                                                                        240
catcattacc cccacattat aatgggatag attcagagca gatactctcc agcaaagaat
                                                                        300
                                                                        301
      <210> 263
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A, T, C \text{ or } G
      <400> 263
tttagcttgt ggtaaatgac tcacaaaact gattttaaaa tcaagttaat gtgaattttg
                                                                         60
aaaattacta cttaatccta attcacaata acaatggcat taaggtttga cttgagttgg
                                                                        120
ttcttagtat tatttatggt aaataggctc ttaccacttg caaataactg gccacatcat
                                                                        180
taatgactga cttcccagta aggctctcta aggggtaagt angaggatcc acaggatttg
                                                                        240
agatgetaag geceeagaga tegtttgate caaceetett atttteagag gggaaaatgg
                                                                        300
q
                                                                        301
      <210> 264
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 264
aaagacgtta aaccactcta ctaccacttg tggaactctc aaagggtaaa tgacaaascc
                                                                        60
aatgaatgac tctaaaaaca atatttacat ttaatggttt gtagacaata aaaaaacaag
                                                                        120
gtggatagat ctagaattgt aacattttaa gaaaaccata scatttgaca gatgagaaag
                                                                       180
ctcaattata gatgcaaagt tataactaaa ctactatagt agtaaagaaa tacatttcac
                                                                       240
accetteata taaatteaet atettggett gaggeaetee ataaaatgta teacgtgeat
                                                                       300
                                                                       301
      <210> 265
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 265
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tgcccaagtt atgtgtaagt cttcttgtga cgcagtattt catattcttg gaagtctcta ttttcagttt gtcaacatgt cagtccaagg ctttgacatg c	cttctctggg atcaactttt tctctaacaa	gagaagccgg gttccatttg cacttgccca	gaagtettet ttteatttet tttetgtaaa	cctggctcta tcaggaggga gaatccaaag	60 120 180 240 300 301
<210> 266 <211> 301 <212> DNA <213> Homo sapie	en				
<400> 266 taccgtctgc ccttcctccc acaccagatc actctttcct ctcttctgtg ttccagcttc atagagacac caatacccat cacagactcc tgacaactgg a	ctacccacag ttttcctgtt aacctctctc	gcttgctatg cttcccaccc ctaagcctcc	agcaagagac cttaagttct ttataaccca	acaacctcct attcctgggg gggtgcacag	60 120 180 240 300 301
<210> 267 <211> 301 <212> DNA <213> Homo sapie	en		·		
<400> 267  aaagagcaca ggccagctca gttctcagtg ctgagtccat atcctcacag gcagcttctg ctcattctga ttcctctct aattcgcttc agcttgtctg	ccaggaaaag agagcctgat tcttttcttt	ctcacctaga attcctagcc caagttggct	ccttctgagg ttgatggtct ttcctcacat	ctgaatcttc ggagtaaagc ccctctgttc	60 120 180 240 300 301
<pre>&lt;210&gt; 268 &lt;211&gt; 301 &lt;212&gt; DNA &lt;213&gt; Homo sapie</pre>	e <b>n</b>				301
<pre>&lt;400&gt; 268 aatgtctcac tcaactactt gatcttggga gagctggttc tcgaagagga agtctaatgg tgctgggtgg ctcagtgagc cttcccattg ttctactttc a</pre>	ttctaaggag aagtaattag ccttttggag	aaggaggaag tcaacggtcc aaagcaagta	gacagatgta ttgtttagac ttattcttaa	actttggatc tcttggaata ggagtaacca	60 120 180 240 300 301
<210> 269 <211> 301 <212> DNA <213> Homo sapie	en				
<400> 269 taacaatata cactagctat aaaattacct ttattcacac atagtcacag accttaaata cttttctgga tattctttac tacagtagca caaccacctt t	atctcaaaac ttcacattgt aaaatcttat	aattctgcaa tttctatgtc taaaattcct	attcttagtg tactgaaaat ggtattatca	aagtttaact aagttcacta cccccaatta	60 120 180 240 300 301

```
<210> 270
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 270
 cattgaagag cttttgcgaa acatcagaac acaagtgctt ataaaattaa ttaagcctta
                                                                          60
 cacaagaata catatteett ttatttetaa ggagttaaac atagatgtag etgatgtgga
                                                                         120
 gagettgetg gtgeagtgea tattggataa cactatteat ggeegaattg ateaagteaa
                                                                         180
 ccaactcctt gaactggatc atcagaagaa gggtggtgca cgatatactg cactagataa
                                                                         240
 tggaccaacc aactaaattc tctcaccagg ctgtatcagt aaactggctt aacagaaaac
                                                                        , 300
 а
       <210> 271
       <211> 301
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       <223> n = A,T,C or G
       <400> 271
aaaaggttct cataagatta acaatttaaa taaatatttg atagaacatt ctttctcatt
                                                                         60
tttatagete atetttaggg ttgatattca gttcatgett ceettgetgt tettgateca
                                                                        120
gaartgcaat cacttcatca gcctgtattc gctccaattc tctataaagt gggtccaagg
                                                                        180
tgaaccacag agccacagca cacctettte cettggtgae tgeetteace ceatganggt
                                                                        240
teteteetee agatganaac tgatcatgeg eccacatttt gggttttata gaagcagtca
                                                                        300
C
                                                                        301
      <210> 272
      <211> 301
     <212> DNA
      <213> Homo sapien
      <400> 272
taaattgcta agccacagat aacaccaatc aaatggaaca aatcactgtc ttcaaatgtc
                                                                         60
ttatcagaaa accaaatgag cctggaatct tcataatacc taaacatgcc gtatttagga
                                                                        120
tccaataatt ccctcatgat gagcaagaaa aattctttgc gcacccctcc tgcatccaca
                                                                        180
gcatcttctc caacaaatat aaccttgagt ggcttcttgt aatctatgtt ctttgttttc
                                                                        240
ctaaggactt ccattgcatc tcctacaata ttttctctac gcaccactag aattaagcag
                                                                        300
                                                                        301
      <210> 273
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 273
acatgtgtgt atgtgtatct ttgggaaaan aanaagacat cttgtttayt attttttgg
                                                                        60
agagangctg ggacatggat aatcacwtaa tttgctayta tyactttaat ctgactygaa
```

```
gaaccgtcta aaaataaaat ttaccatgtc dtatattcct tatagtatgc ttatttcacc
                                                                         180
 ttytttctgt ccagagagag tatcagtgac ananatttma gggtgaamac atgmattggt
                                                                         240
 gggaettnty tttaengagm accetgeeeg sgegeeeteg makengantt eegesanane
                                                                         300
                                                                         301
       <210> 274
       <211> 301
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 274
cttatatact ctttctcaga ggcaaaagag gagatgggta atgtagacaa ttctttgagg
                                                                          60
aacagtaaat gattattaga gagaangaat ggaccaagga gacagaaatt aacttgtaaa
                                                                         120
tgattctctt tggaatctga atgagatcaa gaggccagct ttagcttgtg gaaaagtcca
                                                                         180
tetaggtatg gttgeattet egtettettt tetgeagtag ataatgaggt aacegaagge
                                                                         240
aattgtgett ettttgataa gaagetttet tggteatate aggaaattee aganaaagte
                                                                         300
                                                                         301
      <210> 275
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 275
teggtgteag cageacgtgg cattgaacat tgcaatgtgg ageceaaace acagaaaatg
                                                                         60
gggtgaaatt ggccaacttt ctattaactt atgttggcaa ttttgccacc aacagtaagc
                                                                        120
tggcccttct aataaaagaa aattgaaagg tttctcacta aacggaatta agtagtggag
                                                                        180
tcaagagact cccaggcctc agcgtacctg cccgggcggc cgctcgaagc cgaattctgc
                                                                        240
agatatecat cacactggeg gnegetegan catgeateta gaaggneeaa ttegeeetat
                                                                        300
                                                                        301
      <210> 276
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 276
tgtacacata ctcaataaat aaatgactgc attgtggtat tattactata ctgattatat
                                                                         60
ttatcatgtg acttctaatt agaaaatgta tccaaaagca aaacagcaga tatacaaaat
                                                                        120
taaagagaca gaagatagac attaacagat aaggcaactt atacattgag aatccaaatc
                                                                        180
caatacattt aaacatttgg gaaatgaggg ggacaaatgg aagccagatc aaatttgtgt
                                                                        240
aaaactattc agtatgtttc ccttgcttca tgtctgagaa ggctctcctt caatggggat
                                                                        300
                                                                        301
      <210> 277
      <211> 301
      <212> DNA
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<213> Homo sapien

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<220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 277
tttgttgatg tcagtatttt attacttgcg ttatgagtgc tcacctggga aattctaaag
                                                                         60
atacagagga cttggaggaa gcagagcaac tgaatttaat ttaaaagaag gaaaacattg
                                                                        120
gaatcatggc actcctgata ctttcccaaa tcaacactct caatgcccca ccctcgtcct
                                                                        180
caccatagtg gggagactaa agtggccacg gatttgcctt angtgtgcag tgcgttctga
                                                                        240
gttcnctgtc gattacatct gaccagtctc ctttttccga agtccntccg ttcaatcttg
                                                                       300
                                                                        301
      <210> 278
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A, T, C \text{ or } G
      <400> 278
taccactaca ctccagcctg ggcaacagag caagacctgt ctcaaagcat aaaatggaat
                                                                        60
aacatatcaa atgaaacagg gaaaatgaag ctgacaattt atggaagcca gggcttgtca
                                                                        1.20
cagtetetae tgttattatg cattacetgg gaatttatat aageeettaa taataatgee
                                                                        180
aatgaacatc tcatgtgtgc tcacaatgtt ctggcactat tataaqtqct tcacaqqttt
                                                                        240
tatgtgttct tcgtaacttt atggantagg tactcggccg cgaacacqct aaqccqaatt
                                                                       300
                                                                       301
      <210> 279
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 279
aaagcaggaa tgacaaagct tgcttttctg gtatgttcta ggtgtattgt gacttttact
                                                                        60
gttatattaa ttgccaatat aagtaaatat agattatata tgtatagtgt ttcacaaagc
                                                                       120
ttagaccttt accttccagc caccccacag tgcttgatat ttcagagtca gtcattggtt
                                                                       180
atacatgtgt agttccaaag cacataagct agaanaanaa atatttctag ggagcactac
                                                                       240
catctgtttt cacatgaaat gccacacaca tagaactcca acatcaattt cattgcacag
                                                                       300
                                                                       301
      <210> 280
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 280
ggtactggag ttttcctccc ctgtgaaaac gtaactactg ttgggagtga attgaggatg
                                                                        60
tagaaaggtg gtggaaccaa attgtggtca atggaaatag gagaatatgg ttctcactct
                                                                       120
```

tgagaaaaaa acctaagatt agcccaggta gttgcctgta acttcagttt ttctgcctgg gtttgatata gtttagggtt ggggttagat taagatctaa attacatcag gacaaagaga cagactatta actccacagt taattaagga ggtatgttcc atgtttattt gttaaagcag t	180 240 300 301
<210> 281 <211> 301 <212> DNA <213> Homo sapien	
<400> 281	
aggtacaaga aggggaatgg gaaagagetg etgetgtgge attgttcaae ttggatatte	, 60
gccgagcaat ccaaatcctg aatgaagggg catcttctga aaaaggagat ctgaatctca	120
atgtggtage aatggettta tegggttata eggatgagaa gaaeteeett tggagagaaa tgtgtageae aetgegatta eagetaaata aeeegtattt gtgtgteatg tttgeattte	180 240
tgacaagtga aacaggatet tacgatggag ttttgtatga aaacaaagtt gcagtacete	300
g .	301
<210> 282	
<211> 301	
<212> DNA	
<213> Homo sapien	
<400> 282	
caggtactac agaattaaaa tactgacaag caagtagttt cttggcgtgc acgaattgca	60
tccagaaccc aaaaattaag aaattcaaaa agacattttg tgggcacctg ctagcacaga	120
agegeagaag caaageeeag geagaaceat getaacetta cageteagee tgeacagaag egeagaagea aageeeagge agaaceatge taacettaca geteageetg cacagaageg	180 240
cagaagcaaa gcccaggcag aacatgctaa ccttacagct cagcctgcac agaagcacag	300
a	301
<210> 283	
<211> 301	
<212> DNA	
<213> Homo sapien	٠.
<400> 283	
atctgtatac ggcagacaaa ctttatarag tgtagagagg tgagcgaaag gatgcaaaag	60
cactttgagg gctttataat aatatgctgc ttgaaaaaaa aaatgtgtag ttgatactca	120
gtgcatctcc agacatagta aggggttgct ctgaccaatc aggtgatcat tttttctatc	180 240
acttcccagg ttttatgcaa aaattttgtt aaattctata atggtgatat gcatctttta ggaaacatat acatttttaa aaatctattt tatgtaagaa ctgacagacg aatttgcttt	300
g	301
<210> 284 <211> 301	
<212> DNA	
<213> Homo sapien	•
<400> 284	
Caggtacaaa acgctattaa gtggcttaga atttgaacat ttgtggtctt tatttacttt	60
gcttcgtgtg tgggcaaagc aacatcttcc ctaaatatat attaccaaga aaagcaagaa	120
gcagattagg tttttgacaa aacaaacagg ccaaaagggg gctgacctgg agcagagcat	180
ggtgagaggc aaggcatgag agggcaagtt tgttgtggac agatctgtgc ctactttatt actggagtaa aagaaaacaa agttcattga tgtcgaagga tatatacagt gttagaaatt	240 300
accygaycaa aagaaaacaa ayttcattga tgtcgaagga tatatacagt gttagaaatt a	300

<211> 301

בו באפחתה אות הופאפתה ו

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<211> 301
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(301)
       \langle 223 \rangle n = A,T,C or G
       <400> 285
acatcaccat gatcggatcc cccacccatt atacgttgta tgtttacata aatactcttc
                                                                         60
aatgatcatt agtgttttaa aaaaaatact gaaaactcct tctgcatccc aatctctaac
                                                                       120
caggaaagca aatgctattt acagacctgc aagccctccc tcaaacnaaa ctatttctgg
                                                                        180
attaaatatg tetgaettet tttgaggtea caegaetagg caaatgetat ttaegatetg
                                                                        240
caaaagctgt ttgaagagtc aaagccccca tgtgaacacg atttctggac cctgtaacag
                                                                        300
                                                                        301
       <210> 286
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 286
taccactgca ttccagcctg ggtgacagag tgagactccg tctccaaaaa aaactttgct
                                                                         60
tgtatattat ttttgcctta cagtggatca ttctagtagg aaaggacagt aagattttt
                                                                        120
atcaaaatgt gtcatgccag taagagatgt tatattettt teteatttet teeccaceca
                                                                        180
aaaataagct accatatagc ttataagtct caaatttttg ccttttacta aaatgtgatt
                                                                        240
gtttctgttc attgtgtatg cttcatcacc tatattaggc aaattccatt ttttcccttg
                                                                        300
                                                                        301
      <210> 287
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 287
tacagatctg ggaactaaat attaaaaatg agtgtggctg gatatatgga gaatgttggg
                                                                         60
cccagaagga acgtagagat cagatattac aacagctttg ttttgagggt tagaaatatg
                                                                        120
aaatgatttg gttatgaacg cacagtttag gcagcagggc cagaatcctg accetctgcc
                                                                        180
ccgtggttat ctcctcccca gcttggctgc ctcatgttat cacagtattc cattttgttt
                                                                        240
gttgcatgtc ttgtgaagcc atcaagattt tctcgtctgt tttcctctca ttggtaatgc
                                                                        300
                                                                        301
      <210> 288
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 288
gtacacctaa ctgcaaggac agctgaggaa tgtaatgggc agccgctttt aaagaagtag
                                                                        60
agtcaatagg aagacaaatt ccagttccag ctcagtctgg gtatctgcaa agctgcaaaa
                                                                        120
gatctttaaa gacaatttca agagaatatt tccttaaagt tggcaatttg gagatcatac
                                                                       180
aaaagcatct gcttttgtga tttaatttag ctcatctggc cactggaaga atccaaacag
                                                                       240
tctgccttaa ttttggatga atgcatgatg gaaattcaat aatttagaaa gttaaaaaaa
                                                                       300
                                                                       301
      <210> 289
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<212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 289
ggtacactgt ttccatgtta tgtttctaca cattgctacc tcagtgctcc tggaaactta
                                                                         60
gettttgatg tetecaagta gtecacette atttaactet ttgaaactgt ateatetttg
                                                                        120
ccaagtaaga gtggtggcct atttcagctg ctttgacaaa atgactggct cctgacttaa
                                                                        180
cgttctataa atgaatgtgc tgaagcaaag tgcccatggt ggcggcgaan aagagaaaga
                                                                        240
tgtgttttgt tttggactet ctgtggteee ttecaatget gtgggtttee aaccagngga
                                                                        300
                                                                        301
      <210> 290
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 290
acactgaget ettettgata aatatacaga atgettggea tatacaagat tetatactae
                                                                         60
tgactgatct gttcatttct ctcacagctc ttacccccaa aagcttttcc accctaagtg
                                                                        120
ttctgacctc cttttctaat cacagtaggg atagaggcag anccacctac aatgaacatg
                                                                       180
gagttctatc aagaggcaga aacagcacag aatcccagtt ttaccattcg ctagcagtgc
                                                                        240
tgccttgaac aaaaacattt ctccatgtct cattttcttc atgcctcaag taacagtgag
                                                                        300
                                                                        301
      <210> 291
      <211> 301
      <212> DNA
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      <400> 291
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tatatcagct agattttttt tctatgcttt acctgctatg gaaaatttga cacattctgc
                                                                       120
tttactcttt tgtttatagg tgaatcacaa aatgtatttt tatgtattct gtagttcaat
                                                                       180
agccatggct gtttacttca tttaatttat ttagcataaa gacattatga aaaggcctaa
                                                                       240
acatgagett caetteecca etaactaatt ageatetgtt atttettaac egtaatgeet
                                                                       300
                                                                       301
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      <211> 301
      <212> DNA
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      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 292
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                                                                         60
tgtattaaat aattttaag tttaaaagat aaaataccat cattttaaat gttggtattc
                                                                        120
aaaaccaaag natataaccg aaaggaaaaa cagatgagac ataaaatgat ttgcnagatg
                                                                        180
ggaaatatag tasttyatga atgttnatta aattccagtt ataatagtgg ctacacactc
                                                                        240
tcactacaca cacagacccc acagtcctat atgccacaaa cacatttcca taacttgaaa
                                                                        300
                                                                        301
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      <211> 301
      <212> DNA
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ttgtgtagtc acttctgatt ctgacaatca atcaatcaat ggcctagagc actgactgtt
                                                                        120
aacacaaacg tcactagcaa agtagcaaca gctttaagtc taaatacaaa gctgttctgt
                                                                        180
gtgagaattt tttaaaaggc tacttgtata ataaccettg tcatttttaa tgtacetegg
                                                                        240
ccgcgaccac gctaagccga attctgcaga tatccatcac actggcggcc gctcgagcat
                                                                        300
                                                                        301
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      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
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      \langle 223 \rangle n = A,T,C or G
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attcaataaa attaccttta ttcacacatc tcaaaacaat tctgcaaatt cttagtgaag
                                                                        120
tttaactata gtcacaganc ttaaatattc acattgtttt ctatgtctac tgaaaataag
                                                                        180
ttcactactt ttctgggata ttctttacaa aatcttatta aaattcctgg tattatcacc
                                                                       240
cccaattata cagtagcaca accaccttat gtagttttta catgatagct ctgtagaggt
                                                                       300
t
                                                                       301
      <210> 295
      <211> 305
      <212> DNA
      <213> Homo sapien
      <400> 295
gtactettte tetecectee tetgaattta attettteaa ettgeaattt geaaggatta
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cacatttcac tgtgatgtat attgtgttgc aaaaaaaaa gtgtctttgt ttaaaattac
                                                                       120
ttggtttgtg aatccatctt gctttttccc cattggaact agtcattaac ccatctctga
                                                                       180
actggtagaa aaacrtctga agagctagtc tatcagcatc tgacaggtga attggatggt
                                                                       240
tctcagaacc atttcaccca gacagcctgt ttctatcctg tttaataaat tagtttgggt
                                                                       300
tctct
                                                                       305
      <210> 296
      <211> 301
      <212> DNA
      <213> Homo sapien
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aggtactatg ggaagctgct aaaataatat ttgatagtaa aagtatgtaa tgtgctatct
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cacctagtag taaactaaaa ataaactgaa actttatgga atctgaagtt attttccttg
                                                                        120
 attaaataga attaataaac caatatgagg aaacatgaaa ccatgcaatc tactatcaac
                                                                        180
 tttgaaaaag tgattgaacg aaccacttag ctttcagatg atgaacactg ataagtcatt
                                                                        240
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                                                                        300
                                                                        301.
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      <211> 300
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
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      <223> n = A, T, C or G
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                                                                        120
acaaagangt gaaccagctg aaagctctcg ggggaanctt acatgtgttg ttaggcctgt
                                                                        180
tccatcattg ggagtgcact ggccatccct caaaatttgt ctgggctggc ctgagtggtc
                                                                        240
acegeacete ggeegegace aegetaagee gaattetgea gatateeate acaetggegg
                                                                       . 300
      <210> 298
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 298
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ggcatctgag agacctggtg ttccagtgtt tctggaaatg ggtcccagtg ccgccggctg
                                                                        120
tgaagetete agateaatea egggaaggge etggeggtgg tggeeacetg gaaceaceet
                                                                        180
gtcctgtctg tttacatttc actaycaggt tttctctggg cattacnatt tgttccccta
                                                                        240
caacagtgac ctgtgcattc tgctgtggcc tgctgtgtct gcaggtggct ctcagcgagg
                                                                       300
                                                                        301
      <210> 299
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 299
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teactgeace etetgeetee caggitegag caatteteet geeteageet eccaggiage
                                                                       120
tgggattgca ggctcacgcc accataccca gctaattttt ttgtattttt agtagagacg
                                                                       180
gagtttcgcc atgttggcca gctggtctca aactcctgac ctcaagcgac ctgcctgcct
                                                                       240
cggcctccca aagtgctgga attataggca tgagtcaaca cgcccagcct aaagatattt
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                                                                       301
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      <211> 301
      <212> DNA
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                                                                        120
getgeattee acaaggttet cageetaatg agttteacta cetgecagte teaaaactta
                                                                        180
gtaaagcaag accatgacat tcccccacgg aaatcagagt ttgccccacc gtcttgttac
                                                                        240
tataaagcct gcctctaaca qtccttqctt cttcacacca atcccqaqcq catccccat
                                                                       300
g
                                                                        301
      <210> 301
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 301
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agaggacccc aggtctccaa gcaaccacat ggtcaagggc atgaataatt aaaagttggt
                                                                        120
gggaactcac aaagaccete agagetgaga cacccacaac agtgggaget cacaaagace
                                                                        180
ctcagagctg agacacccac aacagtggga gctcacaaag accctcagag ctgagacacc
                                                                       240
cacaacagca cctcgttcag ctgccacatg tgtgaataag gatgcaatgt ccagaagtgt
                                                                       300
t. i
                                                                       301
      <210> 302
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      <212> DNA
      <213> Homo sapien
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tgaattttga aaattactac ttaatcctaa ttcacaataa caatggcatt aaggtttgac
                                                                       120
ttgagttggt tcttagtatt atttatggta aataggctct taccacttgc aaataactgg
                                                                       180
ccacatcatt aatgactgac ttcccagtaa ggctctctaa ggggtaagta ggaggatcca
                                                                       240
caggatttga gatgctaagg ccccagagat cgtttgatcc aaccctctta ttttcagagg .
                                                                       300
                                                                       301
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      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 303
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atattgtttt ttgacagttt aacacatctt cttctgtcag agattctttc acaatagcac
                                                                       120
tggctaatgg aactaccgct tgcatgttaa aaatggtggt ttgtgaaatg atcataggcc
                                                                       180
agtaacgggt atgtttttct aactgatctt ttgctcgttc caaagggacc tcaagacttc
                                                                       240
catcgatttt atatctgggg tctagaaaag gagttaatct gttttccctc ataaattcac
                                                                       300
C
                                                                       301
      <210> 304
      <211> 301
      <212> DNA
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tattagtttc agtttcagct tacccacttt ttgtctgcaa catgcaraas agacagtgcc
                                                                       120
ctttttagtg tatcatatca ggaatcatct cacattggtt tgtgccatta ctggtgcagt
                                                                       180
gactttcagc cacttgggta aggtggagtt ggccatatgt ctccactgca aaattactga
                                                                       240
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ttttcctttt gtaattaata agtgtgtgtg tgaagattct ttgagatgag gtatatatct
                                                                         300
                                                                         301
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       <211> 301
       <212> DNA ·
       <213> Homo sapien
       <220>
       <221> misc feature
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       <223> n = A,T,C or G
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cagggggaca gacctggaca gacacgttgt catttgctgc tgtgggtagg aaaatqqqcq
                                                                        120
taaaggagga gaaacagata caaaatctcc aactcagtat taaggtattc tcatgcctag
                                                                        180
aatattggta gaaacaagaa tacattcata tggcaaataa ctaaccatgg tggaacaaaa
                                                                        240
ttctgggatt taagttggat accaangaaa ttgtattaaa agagctgttc atggaataag
                                                                        300
                                                                        301
      <210> 306
      <211> 8
      <212> PRT
      <213> Homo sapien
      <400> 306
Val Leu Gly Trp Val Ala Glu Leu
 1
      <210> 307
      <211> 637
      <212> DNA
      <213> Homo sapien
      <400> 307
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ttgtgatcag gtggtctatg gggcttatcc ctacaaagaa gaatccagaa ataggggcac
                                                                       120
attgaggaat gatacttgag cccaaagagc attcaatcat tgttttattt gccttmtttt
                                                                       180
cacaccattg gtgagggagg gattaccacc ctggggttat gaagatggtt gaacacccca
                                                                       240
cacatagcac cggagatatg agatcaacag tttcttagcc atagagattc acagcccaga
                                                                       300
gcaggaggac gcttgcacac catgcaggat gacatggggg atgcgctcgg gattggtgtg
                                                                       360
aagaagcaag gactgttaga ggcaggcttt atagtaacaa gacggtgggg caaactctga
                                                                       420
tttccgtggg ggaatgtcat ggtcttgctt tactaagttt tgagactggc aggtagtgaa
                                                                       480
actcattagg ctgagaacct tgtggaatgc acttgaccca sctgatagag gaagtagcca
                                                                       540
ggtgggagcc tttcccagtg ggtgtgggac atatctggca agattttgtg gcactcctgg
                                                                       600
ttacagatac tggggcagca aataaaactg aatcttg
                                                                       637
      <210> 308
      <211> 647
      <212> DNA
      <213> Homo sapien
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     <221> misc feature
     <222> (1)...(647)
     <223> n = A, T, C or G
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tgctcagggg aaggttcata tgggactttc tactgcccaa ggttctatac aggatataaa
                                                                        120
ggngcctcac agtatagatc tggtagcaaa gaagaagaaa caaacactga tctctttctg
                                                                        180
ccacccctct gaccctttgg aactcctctg accctttaga acaagcctac ctaatatctg
                                                                        240
ctagagaaaa gaccaacaac ggcctcaaag gatctcttac catgaaggtc tcagctaatt
                                                                        300
cttggctaag atgtgggttc cacattaggt tctgaatatg gggggaaggg tcaatttgct
                                                                        360
cattttgtgt gtggataaag tcaggatgcc cagggggccag agcagggggc tgcttgcttt
                                                                        420
gggaacaatg gctgagcata taaccatagg ttatggggaa caaaacaaca tcaaagtcac
                                                                        480
tgtatcaatt gccatgaaga cttgagggac ctgaatctac cgattcatct taaggcagca
                                                                        540
ggaccagttt gagtggcaac aatgcagcag cagaatcaat ggaaacaaca gaatgattgc
                                                                        600
aatgtccttt tttttctcct gcttctgact tgataaaagg ggaccgt
                                                                      : 647
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      <211> 460
      <212> DNA
      <213> Homo sapien
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aatatgattg gctgcacact tccagactga tgaatgatga acgtgatgga ctattgtatg
                                                                       120
                                                                       180
gagcacatct tcagcaagag ggggaaatac tcatcatttt tggccagcag ttgtttgatc
accaaacate atgccagaat actcagcaaa cettettage tettgagaag teaaagteeg
                                                                       240
ggggaattta tteetggcaa ttttaattgg acteettatg tgagagcage ggetaceeag
                                                                       300
ctggggtggt ggagcgaacc cgtcactagt ggacatgcag tggcagagct cctggtaacc
                                                                       360
acctagagga atacacaggc acatgtgtga tgccaagcgt gacacctgta gcactcaaat
                                                                       420
ttgtcttgtt tttgtctttc ggtgtgtaag attcttaagt
                                                                       460
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     <211> 539
      <212> DNA
      <213> Homo sapien
      <400> 310
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ctaaaggttt taaaatatgt caggattgga agaaggcatg gataaagaac aaagttcagt
                                                                       120
taggaaagag aaacacagaa ggaagagaca caataaaagt cattatgtat tetgtgagaa
                                                                       180
gtcagacagt aagatttgtg ggaaatgggt tggtttgttg tatggtatgt attttagcaa
                                                                       240
taatctttat ggcagagaaa gctaaaatcc tttagcttgc gtgaatgatc acttgctgaa
                                                                       300
ttcctcaagg taggcatgat gaaggaggt ttagaggaga cacagacaca atgaactgac
                                                                       360
ctagatagaa agccttagta tactcagcta ggaatagtga ttctgagggc acactgtgac
                                                                       420
atgattatgt cattacatgt atggtagtga tggggatgat aggaaggaag aacttatggc
                                                                       480
atattttcac ccccacaaaa gtcagttaaa tattgggaca ctaaccatcc aggtcaaga
                                                                       539
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     <211> 526
     <212> DNA
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     <220>
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ttttgacgtt ttctctaaac tactaaagag gcattaatga tccataaatt atattatcta
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catttacagc atttaaaatg tgttcagcat gaaatattag ctacagggga agctaaataa
                                                                       180
```

```
attaaacatg gaataaagat ttgtccttaa atataatcta caagaagact ttgatatttg
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tttttcacaa gtgaagcatt cttataaagt gtcataacct ttttggggaa actatgggaa
                                                                        300
aaaatgggga aactctgaag ggttttaagt atcttacctg aagctacaga ctccataacc
                                                                        360
tetetttaea gggageteet geageeeeta eagaaatgag tggetgagat tettgattge
                                                                        420
acagcaagag cttctcatct aaaccctttc cctttttagt atctgtgtat caagtataaa
                                                                        480
agttctataa actgtagtnt acttatttta atccccaaag cacagt
                                                                        526
      <210> 312
      <211> 500
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(500)
      <223> n = A, T, C or G
      <400> 312
cetetetete eccaececet gaetetagag aactgggttt teteceagta etccageaat
                                                                         60
tcatttctga aagcagttga gccactttat tccaaagtac actgcagatg ttcaaactct
                                                                        120
ccatttetet tteeetteea cetgeeagtt ttgetgaete teaacttgte atgagtgtaa
                                                                        180
gcattaagga cattatgctt cttcgattct gaagacaggc cctgctcatg gatgactctg
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gcttcttagg aaaatatttt tcttccaaaa tcagtaggaa atctaaactt atcccctctt
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tgcagatgtc tagcagcttc agacatttgg ttaagaaccc atgggaaaaa aaaaaatcct
                                                                        360
tgctaatgtg gtttcctttg taaaccanga ttcttatttg nctggtatag aatatcagct
                                                                        420
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                                                                        480
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                                                                        500
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      <211> 718
      <212> DNA
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      <220>
      <221> misc_feature
      <222> (1)...(718)
      \langle 223 \rangle n = A,T,C or G
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tgatgataca gaggtgagaa ataagaaagg ctgctgactt taccatctga ggccacacat
                                                                        120
ctgctgaaat ggagataatt aacatcacta gaaacagcaa gatgacaata taatgtctaa
                                                                        180
gtagtgacat gtttttgcac atttccagcc cttttaaata tccacacaca caggaagcac
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aaaaggaagc acagagatcc ctgggagaaa tgcccggccg ccatcttggg tcatcgatga
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gcctcgccct gtgcctgntc ccgcttgtga gggaaggaca ttagaaaatg aattgatgtg
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ttccttaaag gatggcagga aaacagatcc tgttgtggat atttatttga acgggattac
                                                                        420
agatttgaaa tgaagtcaca aagtgagcat taccaatgag aggaaaacag acgagaaaat
                                                                        480
cttgatggtt cacaagacat gcaacaaaca aaatggaata ctgtgatgac acgagcagcc
                                                                        540
aactggggag gagataccac ggggcagagg tcaggattct ggccctgctg cctaactgtg
                                                                        600
cgttatacca atcatttcta tttctaccct caaacaagct gtngaatatc tgacttacgg
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ttcttntggc ccacattttc atnatccacc contentttt aannttantc caaantgt
                                                                        718
      <210> 314
      <211> 358
      <212> DNA
      <213> Homo sapien
      <400> 314
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gaccccatt ctgaagatgt					180
agtcaccagc tccccgacca					240
tagcttctgc tgtaagaggg	tgttgtcccg	ggggctcgtg	cggttattgg	tcctgggctt	300
gaggggggg tagatgcagc	acatggtgaa	gcagatgatg	t	-	341
			•		
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<211> 151					
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(213) HOMO Sapie	511				
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cattcaggga getetggttg					151
<210> 317					•
<211> 151					
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(213) Homo sapie					•
<400> 317				•	
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atcttcattt atctctggcc			tgcggccagc	agatcccagg	120
ccagggctct gttcttgcca	cacctgcttg	a			151
<210> 318			-		
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		•			
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gctgcaggct ggagtgtctt			acattccact	gctgaggctg	120
tgggggcggt ttatcaggca	gtgataaaca	t			151
Z210 - 210					
<210> 319 <211> 151					
<211> 151 <212> DNA					
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Table Monito Sapte	•••				
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catagatagt actaggtatt	aatagatatg	taaagaaaga	aatcacacca	ttaataatgg	120

taagattggg tttatgtgat tttagtgggt a	151
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gagcggctgc ccttttttt ttttttttg ggggggaatt tttttttt aatagttatt	120
gagtgttcta cagcttacag taaataccat	150
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200

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2280

1680

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2984

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Val Ile Glu Leu Glu Arg Lys Phe Ser His Gln Lys Tyr Leu Ser Ala
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Pro Glu Arg Ala His Leu Ala Lys Asn Leu Lys Leu Thr Glu Thr Gln
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agaaaggett tetattteae tggeecaggt agggggaagg agagtaaett tgagtetgtg
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<212> DNA

<213> Homo sapien

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<210> 370

<211> 2184

<212> DNA

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360

## <213> Homo sapien

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Glu Tyr Thr Ile Val His	s Ala Ser P		Cys Ile Ser	Ser Ser	
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Leu Asp Gly Gln Gly Gli 50	ı Arg Gln G 55		Gly His Phe 60	Trp Arg	
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 Gly
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 Pro
 Arg
 Lys

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 Glu

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 Ala
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 Asp

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Lys Asn Lys Val

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DISCOUNTY AND DESCRIPTIONS

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ALY	GIU	val	GIU	GIU	GIU	MEC	пÀа	гÅг	uis	GIU	ser	ASN	Asn	vaı	σтλ

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Gly Ser Leu 1105 Arg	Lys Asn 1090 Arg Gly Ala	Trp 1075 Val ) Ser Ser Met	1060 Cys Gly Lys Gly Lys 1140	Cys Thr Met Lys 1125	Val Arg Ser Gly 1110 Ser Leu	Cys Gly 1095 Lys Asn Arg	Phe 1080 Asp Trp Val	1065 Pro His Cys Gly Lys 1145	Phe Cys Asp Arg Ala 1130 Met	Gly Cys Asp His 1115 Ser	Arg Ser 1100 Cys Gly Lys	Glu 1085 Ala Phe Asp	1070 Ser Met Pro His Cys 1150	Lys Gly Lys Cys Asp 1135 Cys	Met Lys Thr Cys 1120 Asp His
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His		Gln	-	Gln	Gln		Val		Phe	Leu		Lys		Lys	Ala
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~7 .		_	_	152			_	_	153		_		_	1539	
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1585	5				1590	)				Ser 1599	5			_	1600
Pro	Glu	Asn								Gly					Gly
Leu	Ile	Pro		Arg					Pro	Glu				Phe	
Asp	Thr		Asn		Glu	Tyr		Ser		Glu	Gln		Asp		Gln
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Leu	Ile	His	Glu	Glu	Lvs	Gln	Ile	Glu	Val	Val	Glu	Lvs	Met	Asn	Ser
1665					1670		•			1675					1680
		Ser	Leu	Ser			Lve	Glu	T.ve	Asp		T.e.ii	Hie	Glii	
				1685		-, 0	_, _		1690		*TC	al- u	3		
Ser	Thr	Leu		Glu		Ile	Ala	Met	Leu	Arg	Leu				
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<213> Homo sapien

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					_										
7				169		_		_	170					175	
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		195	5				200	)				205	5		Thr
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Ala	Leu	Let	Leu 260		Gly	Ala	Asp	1le 265		Ser	Lys	Asn	Lys 270	His	Gly
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Lys	Phe 290		Ile	Lys	Lys	Lys 295		Asn	Leu	Asn	Ala 300		Asp	Arg	Tyr
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Val	Ser	Leu	Leu	Leu 325	Glu	Gln	Asn	Ile	Asp 330		Ser	Ser	Gln	Asp 335	Leu
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		595			Asp		600					605			
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Lys Lys Asp Arg Ala Trp Leu Arg Cys Pro Glu Ala Val Ala Gly Phe 55

Pro Leu Gly Ser Asp Cys Arg Glu Gly Gly Arg Gln Gly Cys Gly Gly

Ser Asp Asp Glu Asp Asp Leu Gly Val Ala Pro Gly Leu Ala Pro Ala

Trp Ala Leu Thr Gln Pro Pro Ser Gln Ser Pro Gly Pro Gln Ser Leu

Pro Ser Thr Pro Ser Ser Ile Trp Pro Gln Trp Val Ile Leu Ile Thr 120

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<400> 385
ttcccaggtg atgtgcgagg gaagacacat ttactatect tgatggggct gattcettta 60
gtttctctag cagcagatgg gttaggagga agtgacccaa gtggttgact cctatgtgca 120
teteaaagee atetgetgte ttegagtaeg gacacateat caeteetgea ttgttgatea 180
aaacgtggag gtgcttttcc tcagctaaga agcccttagc aaaagctcga atagacttag 240
tatcagacag gtccagtttc cgcaccaaca cctgctggtt ccctgtcgtg gtctggatct 300
ctttggccac caattccccc ttttccacat cccggca
<210> 386
<211> 300
<212> DNA
<213> Homo sapiens
<400> 386
gggcccgcta ccggcccagg ccccgcctcg cgagtcctcc tccccgggtg cctgcccgca 60
gecegetegg eccagagggt gggegegggg etgeetetae eggetggegg etgtaaetea 120
gegacettgg eeegaagget etageaagga eeeacegace eeageegegg eggeggee 180
geggaetttg eeeggtgtgt ggggeggage ggaetgegtg teegeggaeg ggeagegaag 240
atgttageet tegetgeeag gaeegtggae egateeeagg getgtggtgt aaceteagee 300
<210> 387
<211> 537
<212> DNA
<213> Homo sapiens
<400> 387
gggccgagtc gggcaccaag ggactetttg caggetteet teeteggate atcaaggetg 60
ccccctcctg tgccatcatg atcagcacct atgagttcgg caaaagcttc ttccagaggc 120
tgaaccagga ccggcttctg ggcggctgaa aggggcaagg aggcaaggac cccgtctctc 180
ccacggatgg ggagaggca ggaggagacc cagccaagtg ccttttcctc agcactgagg 240
gagggggett gttteeette eeteeeggeg aeaageteea gggeaggget gteeetetgg 300
geggeeeage aetteeteag acaeaaette tteetgetge teeagtegtg gggateatea 360
cttacccacc ccccaagttc aagaccaaat cttccagctg cccccttcgt gtttccctgt 420
gtttgctgta gctgggcatg tctccaggaa ccaagaagcc ctcagcctgg tgtagtctcc 480
ctgacccttg ttaattcctt aagtctaaag atgatgaact tcaaaaaaaa aaaaaaa
```

```
<210> 388
 <211> 520
 <212> DNA
 <213> Homo sapiens
<400> 388
aggataattt ttaaaccaat caaatgaaaa aaacaaacaa acaaaaaagg aaatgtcatg 60
tgaggttaaa ccagtttgca ttcccctaat gtggaaaaag taagaggact actcagcact 120
gtttgaagat tgcctcttct acagcttctg agaattgtgt tatttcactt gccaagtgaa 180
ggaccccctc cccaacatgc cccagcccac ccctaagcat ggtcccttgt caccaggcaa 240
ccaggaaact gctacttgtg gacctcacca gagaccagga gggtttggtt agctcacagg 300 ;
acttececca ecceagaaga ttageatece atactagaet catacteaae teaactagge 360
tcatactcaa ttgatggtta ttagacaatt ccatttcttt ctggttatta taaacagaaa 420
atctttcctc ttctcattac cagtaaaggc tcttggtatc tttctgttgg aatgatttct 480
atgaacttgt cttattttaa tggtgggttt tttttctggt
<210> 389
<211> 365
<212> DNA
<213> Homo sapiens
<400> 389
cgttgcccca gtttgacaga aggaaaggcg gagcttattc aaagtctaga gggagtggag 60
gagttaaggc tggatttcag atctgcctgg ttccagccgc agtgtgccct ctgctccccc 120
aacgactttc caaataatct caccagegee ttecagetca ggegteetag aagegtettg 180
aagcctatgg ccagctgtct ttgtgttccc tctcacccgc ctgtcctcac agctgagact 240
cccaggaaac cttcagacta ccttcctctg ccttcagcaa ggggcgttgc ccacattctc 300
tgagggtcag tggaagaacc tagactccca ttgctagagg tagaaagggg aagggtgctg 360
gggag
<210> 390
<211> 221
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(221)
<223> n = A, T, C or G
<400> 390
tgcctctcca tcctggcccc gacttctctg tcaggaaagt ggggatggac cccatctgca 60
tacacggntt ctcatgggtg tggaacatct ctgcttgcgg tttcaggaag gcctctggct 120
gctctangag tctgancnga ntcgttgccc cantntgaca naaggaaagg cggagcttat 180
tcaaagtcta gagggagtgg aggagttaag gctggatttc a
<210> 391
<211> 325
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(325)
\langle 223 \rangle n = A,T,C or G
<400> 391
```

```
tggagcaggt cccgaggcct ccctagagcc tggggccgac tctgtgncga tgcangcttt 60
ctctcgcgcc cagcctggag ctgctcctgg catctaccaa caatcagncg aggcgagcag 120
tagccaggge actgctgcca acagccagte cnnataccat catgtnaccc ggtgngctct 180
naanttngat ntccanagec ctacccaten tagttetget etcecacegg ntaccagece 240
cactgoccag gaatcotaca gocagtacco tgtoccgacg tototaccta ccagtacgat 300
gagacctccg gctactacta tgacc
<210> 392
<211> 277
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(277)
<223> n = A,T,C or G
<400> 392
atattgttta actccttcct ttatatcttt taacattttc atggngaaag gttcacatct 60
agteteaett nggenagngn etectaettg agtetettee eeggeetgnn eeagtngnaa 120
antaccanga accgncatgn cttaanaacn ncctggtttn tgggttnntc aatgactgca 180
tgcagtgcac caccetgtcc actacgtgat gctgtaggat taaagtctca cagtgggcgg 240
ctgaggatac agcgccgcgt cctgtgttgc tggggaa
<210> 393
<211> 566
<212> DNA
<213> Homo sapiens
<400> 393
actagtecag tgtggtggaa ttegeggeeg egtegaegga eaggteaget gtetggetea 60
gtgatctaca ttctgaagtt gtctgaaaat gtcttcatga ttaaattcag cctaaacgtt 120
ttgccgggaa cactgcagag acaatgctgt gagtttccaa ccttagccca tctgcgggca 180
gagaaggtct agtttgtcca tcagcattat catgatatca ggactggtta cttggttaag 240
gaggggtcta ggagatctgt cccttttaga gacaccttac ttataatgaa gtatttggga 300
gggtggtttt caaaagtaga aatgteetgt atteegatga teateetgta aacattttat 360
catttattaa tcatccctgc ctgtgtctat tattatattc atatctctac gctggaaact 420
cattetetge etgagtttta atttttgtee aaagttattt taatetatae aattaaaage 540
ttttgcctat caaaaaaaa aaaaaa
<210> 394
<211> 384
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(384)
\langle 223 \rangle n = A,T,C or G
<400> 394
gaacatacat gtcccggcac ctgagctgca gtctgacatc atcgccatca cgggcctcgc 60
tgcaaattng gaccgggcca aggctggact gctggagcgt gtgaaggagc tacaggccna 120
gcaggaggac cgggctttaa ggagttttaa gctgagtgtc actgtagacc ccaaatacca 180
teccaagatt ategggagaa agggggeagt aattacecaa ateeggttgg ageatgaegt 240
gaacatccag tttcctgata aggacgatgg gaaccagccc caggaccaaa ttaccatcac 300
agggtacgaa aagaacacag aagetgecag ggatgetata etgagaattg tgggtgaaet 360
```

```
tgagcagatg gtttctgagg acgt
                                                                     384
 <210> 395
 <211> 399
 <212> DNA
 <213> Homo sapiens
<400> 395
ggcaaaactg tgtgacctca ataagacctc gcagatccaa ggtcaagtat caqaaqtqac 60
tctgaccttg gactccaaga cctacatcaa cagcctggct atattagatg atgagccagt 120
tatcagaggt ttcatcattg cggaaattgt ggagtctaag gaaatcatgg cctctgaagt 180
attcacgtct ttccagtacc ctgagttctc tatagagttg cctaacacag gcagaattgg 240 ,
ccagctactt gtctgcaatt gtatcttcaa.gaataccctg gccatccctt tgactgacgt 300
caagttetet ttggaaagee tgggeatete eteaetaeag acetetgaee atgggaeggt 360
gcagcctggt gagaccatcc aatcccaaat aaaatgcac
<210> 396
<211> 403
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(403)
\langle 223 \rangle n = A,T,C or G
<400> 396
tggagttntc agtgcaaaca agccataaag cttcagtagc aaattactgt ctcacagaaa 60
gacattttca acttctgctc cagctgctga taaaacaaat catgtgttta gcttgactcc 120
agacaaggac aacctgttcc ttcataactc tctagagaaa aaaaggagtt gttagtagat 180
actaaaaaaa gtggatgaat aatctggata tttttcctaa aaagattcct tgaaacacat 240
taggaaaatg gagggcctta tgatcagaat gctagaatta gtccattgtg ctgaagcagg 300
gtttagggga gggagtgagg gataaaagaa ggaaaaaaag aagagtgaga aaacctattt 360
atcaaagcag gtgctatcac tcaatgttag gccctgctct ttt
                                                                    403
<210> 397
<211> 100
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(100)
<223> n = A,T,C or G
<400> 397
actagtneag tgtggtggaa ttegeggeeg egtegaeeta naaneeatet etatageaaa 60
tccatccccg ctcctggttg gtnacagaat gactgacaaa
                                                                    100
<210> 398
<211> 278
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(278)
<223> n = A,T,C or G
```

```
<400> 398
geggeegegt egacageagt teegeeageg etegeeeetg ggtggggatg tgetgeaege 60
ccacctggac atctggaagt cagcggcctg gatgaaagag cggacttcac ctggggcgat 120
teactactgt gcetegacea gtgaggagag etggacegae agegaggtgg acteateatg 180
ctccgggcag cccatccacc tgtggcagtt cctcaaggag ttgctactca agccccacag 240
ctatggccgc ttcattangt ggctcaacaa ggagaagg
<210> 399
<211> 298
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(298)
<223> n = A,T,C or G
<400> 399
acggaggtgg aggaagcgnc cctgggatcg anaggatggg tcctgncatt gaccncctcn 60
ggggtgceng catggagege atgggegegg geetgggeea eggeatggat egegtggget 120
ccgagatcga gcgcatgggc ctggtcatgg accgcatggg ctccgtggag cgcatgggct 180
ceggeattga gegeatggge cegetgggee tegaceaeat ggeeteeane attganegea 240
tgggccagac catggagcgc attggctctg gcgtggagcn catgggtgcc ggcatggg
<210> 400
<211> 548
<212> DNA
<213> Homo sapiens
<400> 400
acatcaacta cttcctcatt ttaaggtatg gcagttccct tcatcccctt ttcctgcctt 60
gtacatgtac atgtatgaaa tttccttctc ttaccgaact ctctccacac atcacaaggt 120
tgagtctctt ttttccacgt ttaaggggcc atggcaggac ttagagttgc gagttaagac 240
tgcagagggc tagagaatta tttcatacag gctttgaggc cacccatgtc acttatcccg 300
tataccetet caccatecee ttgtetacte tgatgeecee aagatgeaac tgggeageta 360
gttggcccca taattctggg cetttgttgt ttgttttaat tacttgggca tcccaggaag 420
ctttccagtg atctcctacc atgggccccc ctcctgggat caagcccctc ccaggccctg 480
tecceagece etectgeece ageceaeceg ettgeettgg tgeteagece teccattggg 540
agcaggtt
<210> 401
<211> 355
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(355)
<223> n = A, T, C or G
<400> 401
actgtttcca tgttatgttt ctacacattg ctacctcagt gctcctggaa acttagcttt 60
tgatgtetee aagtagteea eetteattta aetetttgaa aetgtateat etttgeeaag 120
taagagtggt ggcctatttc agctgctttg acaaaatgac tggctcctga cttaacgttc 180
tataaatgaa tgtgctgaag caaagtgccc atggtggcgg cgaagaagan aaagatgtgt 240
tttgttttgg actctctgtg gtcccttcca atgctgnggg tttccaacca ggggaagggt 300
```

```
cccttttgca ttgccaagtg ccataaccat gagcactact ctaccatggn tctgc
                                                                    355
<210> 402
<211> 407
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(407)
<223> n = A, T, C or G
<400> 402
atggggcaag ctggataaag aaccaagacc cactggagta tgctgtcttc aagaaaccca 60
tctcacatgc ggtggcatac ataggctcaa aataaaggaa tggagaaaaa tatttcaagc 120
aaatggaaaa cagaaaaaag caggtgttgc actcctactt tctgacaaaa cagactatgc 180
gaataaagat aaaaaagaga aggacattac aaaggtggtc ctgacctttg ataaatctca 240
ttgcttgata ccaacctggg ctgttttaat tgcccaaacc aaaaggataa tttgctgagg 300
ttgtggaget teteceetge agagagteee tgateteeca aaatttggtt gagatgtaag 360
gntgattttg ctgacaactc cttttctgaa gttttactca tttccaa
<210> 403
<211> 303
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(303)
<223> n = A,T,C or G
<400> 403
cagtatttat agccnaactg aaaagctagt agcaggcaag tetcaaatcc aggcaccaaa 60
tectaageaa gageeatgge atggtgaaaa tgeaaaagga gagtetggee aatetacaaa 120
tagagaacaa gacctactca gtcatgaaca aaaaggcaga caccaacatg gatctcatgg 180
gggattggat attgtaatta tagagcagga agatgacagt gatcgtcatt tggcacaaca 240
tettaacaac gacegaaace cattatttac ataaacetee atteggtaac catgttgaaa 300
gga
                                                                   303
<210> 404
<211> 225
<212> DNA
<213> Homo sapiens
<400> 404
aagtgtaact tttaaaaaatt tagtggattt tgaaaattct tagaggaaag taaaggaaaa 60
attgttaatg cactcattta cctttacatg gtgaaagttc tctcttgatc ctacaaacag 120
acattttcca ctcgtgtttc catagttgtt aagtgtatca gatgtgttgg gcatgtgaat 180
ctccaagtgc ctgtgtaata aataaagtat ctttatttca ttcat
<210> 405
<211> 334
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(334)
```

```
\langle 223 \rangle n = A,T,C or G
<400> 405
gagctgttat actgtgagtt ctactaggaa atcatcaaat ctgagggttg tctggaggac 60
ttcaatacac ctcccccat agtgaatcag cttccagggg gtccagtccc tctccttact 120
tcatccccat cccatgccaa aggaagaccc tccctccttg gctcacagcc ttctctaggc 180
ttcccagtgc ctccaggaca gagtgggtta tgttttcagc tccatccttg ctgtgagtgt 240
ctggtgcggt tgtgcctcca gcttctgctc agtgcttcat ggacagtgtc cagcccatgt 300
cactetecae teteteanng tggateceae ecet
<210> 406
<211> 216
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(216)
\langle 223 \rangle n = A,T,C or G
<400> 406
tttcatacct aatgagggag ttganatnac atnnaaccag gaaatgcatg gatctcaang 60
gaaacaaaca cccaataaac tcggagtggc agactgacaa ctgtgagaca tgcacttgct 120
acnaaacaca aatttnatgt tgcacccttg tttctacacc tgtgggttat gacaaagaca 180
actgccaaag aatnttcaag aaggaggact gccant
<210> 407
<211> 413
<212> DNA
<213> Homo sapiens
<400> 407
gctgacttgc tagtatcatc tgcattcatt gaagcacaag aacttcatgc cttgactcat 60
gtaaatgcaa taggattaaa aaataaattt gatatcacat ggaaacagac aaaaaatatt 120
gtacaacatt gcacccagtg tcagattcta cacctggcca ctcaggaagc aagagttaat 180
cccagaggtc tatgtcctaa tgtgttatgg caaatggatg tcatgcacgt accttcattt 240
ggaaaattgt catttgtcca tgtgacagtt gatacttatt cacatttcat atgggcaacc 300
tgccagacag gagaaagtct tcccatgtta aaagacattt attatcttgt tttcctgtca 360
tgggagttcc agaaaaagtt aaaacagaca atgggccagg ttctgtagta aag
<210> 408
<211> 183
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(183)
\langle 223 \rangle n = A,T,C or G
<400> 408
ggagctngcc ctcaattcct ccatntctat gttancatat ttaatgtctt ttgnnattaa 60
tncttaacta gttaatcctt aaagggctan ntaatcctta actagtccct ccattgtgag 120
cattateett ecagtatten eettetnttt tatttaetee tteetggeta eccatgtaet 180
ntt
<210> 409
<211> 250
```

```
<212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(250)
 <223> n = A, T, C or G
 <400> 409
 cccacgcatg ataagctctt tatttctgta agtcctgcta ggaaatcatc aaatctgacg 60
 gtggtttggg ggacctgaac aaacctcctg taattaatca gctttcagtt tctccccta 120
gtccctcctt caacaacata ggaggatcct ccccttcttt ctgctcacgg ccttatctag 180 :
gcttcccagt gcccccagga cagcgtgggc tatgtttaca gcgcntcctt gctgggggg 240
ggccntatgc
 <210> 410
 <211> 306
 <212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(306)
<223> n = A, T, C or G
<400> 410
ggctggtttg caagaatgaa atgaatgatt ctacagctag gacttaacct tgaaatggaa 60
agtettgcaa teccatttge aggateegte tgtgcacatg cetetgtaga gageageatt 120
cccagggacc ttggaaacag ttggcactgt aaggtgcttg ctccccaaga cacatcctaa 180
aaggtgttgt aatggtgaaa accgcttcct tctttattgc cccttcttat ttatgtgaac 240
nactggttgg ctttttttgn atcttttta aactggaaag ttcaattgng aaaatgaata 300
tentge
                                                                    306
<210> 411
<211> 261
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G
<400> 411
agagatattn cttaggtnaa agttcataga gttcccatga actatatgac tggccacaca 60
ggatcttttg tatttaagga ttctgagatt ttgcttgagc aggattagat aaggctgttc 120
tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
cttctctcaa ggngaggcaa a
<210> 412
<211> 241
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1) ... (241)
```

```
<223> n = A, T, C \text{ or } G
<400> 412
gttcaatgtt acctgacatt tctacaacac cccactcacc gatgtattcg ttgcccagtq 60
ggaacatacc agcctgaatt tggaaaaaat aattgtgttt cttgcccagg aaatactacq 120
actgactttg atggctccac aaacataacc cagtgtaaaa acagaagatg tggagggag 180
ctgggagatt tcactgggta cattgaattc ccaaactacc cangcaatta cccagccaac 240
<210> 413
<211> 231
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(231)
<223> n = A.T.C or G
<400> 413
aactettaca atecaagtga etcatetgtg tgettgaate etttecaetg teteatetee 60
ctcatccaag tttctagtac cttctctttg ttgtgaagga taatcaaact gaacaacaaa 120
aagtttactc teeteatttg gaacetaaaa actetettet teetgggtet gagggeteea 180
agaateettg aateanttet cagateattg gggacacean ateaggaace t
<210> 414
<211> 234
<212> DNA
<213> Homo sapiens
<400> 414
actgtccatg aagcactgag cagaagctgg aggcacaacg caccagacac tcacagcaag 60
gatggagctg aaaacataac ccactctgtc ctggaggcac tgggaagcct agagaaggct 120
gtgagccaag gagggagggt cttcctttgg catgggatgg ggatgaagta aggagaggga 180 -
ctggacccc tggaagctga ttcactatgg ggggaggtgt attgaagtcc tcca
<210> 415
<211> 217
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(217)
<223> n = A,T,C or G
<400> 415
gcataggatt aagactgagt atcttttcta cattctttta actttctaag gggcacttct 60
caaaacacag accaggtagc aaatctccac tgctctaagg ntctcaccac cactttctca 120
cacctagcaa tagtagaatt cagtcctact tctgaggcca gaagaatggt tcagaaaaat 180
antggattat aaaaaataac aattaagaaa aataatc
<210> 416
<211> 213
<212> DNA
<213> Homo sapiens
<220>
```

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```
<221> misc feature
 <222> (1)...(213)
 <223> n = A,T,C or G
 <400> 416
atgcatatnt aaagganact gcctcgcttt tagaagacat ctggnctgct ctctgcatga 60
ggcacagcag taaagctctt tgattcccag aatcaagaac tctccccttc agactattac 120
cgaatgcaag gtggttaatt gaaggccact aattgatgct caaatagaag gatattgact 180
atattggaac agatggagtc tctactacaa aag
<210> 417
<211> 303
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(303)
<223> n = A, T, C \text{ or } G
<400> 417
nagtetteag geceateagg gaagtteaca etggagagaa gteatacata tgtaetgtat 60
gtgggaaagg ctttactctg agttcaaatc ttcaagccca tcagagagtc cacactggag 120
agaagccata caaatgcaat gagtgtggga agagcttcag gagggattcc cattatcaag 180
ttcatctagt ggtccacaca ggagagaaac cctataaatg tgagatatgt gggaagggct 240
tcantcaaag ttcgtatctt caaatccatc ngaaggncca cagtatanan aaacctttta 300
agt
<210> 418
<211> 328
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G
<400> 418
tttttggcgg tggtgggca gggacgggac angagtctca ctctgttgcc caggctggag 60
tgcacaggca tgatctcggc tcactacaac ccctgcctcc catgtccaag cgattcttgt 120
gcctcagcct tecetgtage tagaattaca ggcacatgce accacaccca gctagttttt 180
gtatttttag tagagacagg gtttcaccat gttggccagg ctggtctcaa actcctnacc 240
tcagnggtca ggctggtctc aaactcctga cctcaagtga tctgcccacc tcagcctccc 300
aaagtgctan gattacaggc cgtgagcc
<210> 419
<211> 389
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(389)
\langle 223 \rangle n = A,T,C or G
<400> 419
cctcctcaag acggcctgtg gtccgcctcc cggcaaccaa gaagcctgca gtgccatatg 60
```

```
accectgage catggaetgg agcetgaaag geagegtaea eeetgeteet gatettgetg 120
 cttgtttcct ctctgtggct ccattcatag cacagttgtt gcactgaggc ttgtgcaggc 180
 cgagcaagge caagetgget caaagagcaa ccagtcaact ctgccacggt gtgccaggca 240
 ccggttctcc agccaccaac ctcactcgct cccgcaaatg gcacatcagt tcttctaccc 300
 taaaggtagg accaaagggc atctgctttt ctgaagtcct ctgctctatc agccatcacg 360
 tggcagccac tcnggctgtg tcgacgcgg
 <210> 420
 <211> 408
 <212> DNA
 <213> Homo sapiens
 <400> 420
 gttcctccta actcctgcca gaaacagctc tcctcaacat gagagctgca cccctcctcc 60
 tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagace 120
 gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
 gtcccattga cacctttccc actgacccca taaaggaatc ctcatggcca caaggatttg 240
 gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
 gatatagaaa attettgaat gagteetata aacatgaaca ggtttatatt cgaagcacag 360
 acgttgaccg gactttgatg aagtgctatg acaaacctgg caagcccg
 <210> 421
 <211>. 352
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(352)
 <223> n = A, T, C or G
<400> 421
gctcaaaaat ctttttactg atnggcatgg ctacacaatc attgactatt acggaggcca 60
gaggagaatg aggcctggcc tgggagccct gtgcctacta naagcacatt agattatcca 120
ttcactgaca gaacaggtet tttttgggte ettettetee accaenatat acttgeagte 180
ctccttcttg aagattcttt ggcagttgtc tttgtcataa cccacaggtg tagaaacaag 240
ggtgcaacat gaaatttctg tttcgtagca agtgcatgtc tcacaagttg gcangtctgc 300
cacteegagt ttattgggtg tttgttteet ttgagateea tgeattteet gg
<210> 422
<211> 337
<212> DNA
<213> Homo sapiens
<400> 422
atgccaccat gctggcaatg cagcgggcgg tcgaaggcct gcatatccag cccaagctgg 60
cgatgatcga cggcaaccgt tgcccgaagt tgccgatgcc agccgaagcg gtggtcaagg 120
gcgatagcaa ggtgccggcg atcgcggcgg cgtcaatcct ggccaaggtc agccgtgatc 180
gtgaaatggc agctgtcgaa ttgatctacc cgggttatgg catcggcggg cataagggct 240
atccgacacc ggtgcacctg gaagccttgc agcggctggg gccgacgccg attcaccgac 300
gcttcttccg ccggtacggc tggcctatga aaattat
                                                                   337
<210> 423
<211> 310
<212> DNA
<213> Homo sapiens
<220>
```

```
<221> misc feature
<222> (1) . . . (310)
<223> n = A, T, C or G
<400> 423
gctcaaaaat ctttttactg atatggcatg gctacacaat cattgactat tagaggccag 60
aggagaatga ggcctggcct gggagccctg tgcctactan aagencatta gattatccat 120
tcactgacag aacaggtett ttttgggtee ttetteteca ccacgatata ettgcagtee 180
teettettga agattetttg geagttgtet ttgteataac ceaeaggtgt anaaacaagg 240
gtgcaacatg aaatttctgt ttcgtagcaa gtgcatgtct cacagttgtc aagtctgccc 300
                                                                 310
tccgagttta
<210> 424
<211> 370
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(370)
\langle 223 \rangle n = A,T,C or G
<400> 424
gctcaaaaat ctttttactg ataggcatgg ctacacaatc attgactatt agaggccaga 60
ggagaatgag gcctggcctg ggagccctgt gcctactaga agcacattag attatccatt 120
cactgacaga acaggtettt tttgggteet tetteteeac cacgatatae ttgcagteet 180
ccttcttgaa gattctttgg cagttgtctt tgtcataacc cacaggtgta gaaacatcct 240
ggttgaatct cctggaactc cctcattagg tatgaaatag catgatgcat tgcataaagt 300
cacgaaggtg gcaaagatca caacgctgcc cagganaaca ttcattgtga taagcaggac 360
tccgtcgacg
<210> 425
<211> 216
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(216)
\langle 223 \rangle n = A,T,C or G
<400> 425
taacaacnca acatcaaggn aaananaaca ggaatggntg actntgcata aatnggccga 120
anattateca ttatnttaag ggttgactte aggntacage acacagacaa acatgeecag 180
gaggntntca ggaccgctcg atgtnttntg aggagg
<210> 426
<211> 596
<212> DNA
<213> Homo sapiens
<400> 426
cttccagtga ggataaccct gttgccccgg gccgaggttc tccattaggc tctgattgat 60
tggcagtcag tgatggaagg gtgttctgat cattccgact gccccaaggg tcgctggcca 120
getetetgtt ttgetgagtt ggeagtagga cetaatttgt taattaagag tagatggtga 180
getgteettg tattttgatt aacctaatgg cetteecage acgaetegga tteagetgga 240
gacatcacgg caacttttaa tgaaatgatt tgaagggcca ttaagaggca cttcccgtta 300
```

```
ttaggcagtt catctgcact gataacttct tggcagctga gctggtcgga gctgtggccc 360
aaacqcacac ttggcttttg gttttgagat acaactctta atcttttagt catgcttgag 420
ggtggatggc cttttcagct ttaacccaat ttgcactgcc ttggaagtgt agccaggaga 480
atacactcat atactcgtgg gcttagaggc cacagcagat gtcattggtc tactqcctqa 540
gtecegetgg teccatecca ggaeetteca teggegagta cetgggagee egtget
<210> 427
<211> 107
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(107)
<223> n = A,T,C or G
<400> 427
gaagaattca agttaggttt attcaaaggg cttacngaga atcctanacc caggncccag 60
cccgggagca gccttanaga gctcctgttt gactgcccgg ctcagng
<210> 428
<211> 38
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(38)
<223> n = A,T,C or G
<400> 428
gaacttccna anaangactt tattcactat tttacatt
                                                                   38
<210> 429
<211> 544
<212> DNA
<213> Homo sapiens
<400> 429
ctttgctgga cggaataaaa gtggacgcaa gcatgacctc ctgatgaggg cgctgcattt 60
attgaagagc ggctgcagcc ctgcggttca gattaaaatc cgagaattgt atagacgccg 120
atatecaega actettgaag gaetttetga tttatecaea ateaaateat eggtttteag 180
tttggatggt ggctcatcac ctgtagaacc tgacttggcc gtggctggaa tccactcgtt 240
gccttccact tcagttacac ctcactcacc atcctctcct gttggttctg tgctgcttca 300
agatactaag cccacatttg agatgcagca gccatctccc ccaattcctc ctgtccatcc 360
tgatgtgcag ttaaaaaatc tgccctttta tgatgtcctt gatgttctca tcaagcccac 420
gagtttagtt caaagcagta ttcagcgatt tcaagagaag ttttttattt ttgctttgac 480
acctcaacaa gttagagaga tatgcatatc cagggatttt ttgccaggtg gtaggagaga 540
ttat
                                                                   544
<210> 430
<211> 507
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(507)
```

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<223> n = A, T, C or G
<400> 430
cttateneaa tggggeteee aaacttgget gtgeagtgga aacteegggg gaattttgaa 60
gaacactgac acccatcttc caccccgaca ctctgattta attgggctgc agtgagaaca 120
gagcatcaat ttaaaaagct gcccagaatg ttntcctggg cagcgttgtg atctttgccn 180
cettegtgae tttatgeaat geateatget attteatace taatgaggga gtteeaggag 240
attcaaccag gatgtttcta cncctgtggg ttatgacaaa gacaactgcc aaagaatntt 300
caagaaggag gactgcaagt atatcgtggt ggagaagaag gacccaaaaa agacctgttc 360
tgtcagtgaa tggataatct aatgtgcttc tagtaggcac agggctccca ggccaggcct 420
cattetecte tggcetetaa tagteaatga ttgtgtagee atgeetatea gtaaaaagat 480
ttttgagcaa aaaaaaaa aaaaaaa
                                                                    507 .
<210> 431
<211> 392
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(392)
\langle 223 \rangle n = A,T,C or G
<400> 431
gaaaattcag aatggataaa aacaaatgaa gtacaaaata tttcagattt acatagcgat 60
aaacaagaaa gcacttatca ggaggactta caaatggaag tacactctan aaccatcatc 120
tatcatggct aaatgtgaga ttagcacagc tgtattattt gtacattgca aacacctaga 180
aagagatggg aaacaaaatc ccaggagttt tgtgtgtgga gtcctgggtt ttccaacaga 240
catcattcca gcattctgag attagggnga ttggggatca ttctggagtt ggaatgttca 300
acaaaagtga tgttgttagg taaaatgtac aacttctgga tctatgcaga cattgaaggt 360
gcaatgagtc tggcttttac tctgctgttt ct
<210> 432
<211> 387
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(387)
<223> n = A,T,C or G
<400> 432
ggtatccnta cataatcaaa tatagctgta gtacatgttt tcattggngt agattaccac 60
aaatgcaagg caacatgtgt agatetettg tettattett ttgtetataa taetgtattg 120
ngtagtccaa gctctcggna gtccagccac tgngaaacat gctcccttta gattaacctc 180
gtggacnctn ttgttgnatt gtctgaactg tagngccctg tattttgctt ctgtctgnga 240
attetgttge ttetggggca ttteettgng atgeagagga ceaccaeaa gatgaeagea 300
atctgaattg ntccaatcac agctgcgatt aagacatact gaaatcgtac aggaccggga 360
acaacgtata gaacactgga gtccttt
<210> 433
<211> 281
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
```

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<222> (1) ... (281)
<223> n = A.T.C or G
<400> 433
ttcaactage anagaanact getteagggn gtgtaaaatg aaaggettee aegeagttat 60
ctgattaaag aacactaaga gagggacaag gctagaagcc gcaggatgtc tacactatag 120
caggenetat ttgggttgge tggaggaget gtggaaaaca tggagagatt ggegetggag 180
ategeegtgg ctattecten ttgntattae accagngagg ntetetgtnt geccaetggt 240
tnnaaaaccg ntatacaata atgatagaat aggacacaca t
<210> 434
<211> 484
<212> DNA
<213> Homo sapiens
<400> 434
ttttaaaata agcatttagt gctcagtccc tactgagtac tctttctctc ccctcctctg 60
aatttaattc tttcaacttg caatttgcaa ggattacaca tttcactgtg atgtatattg 120
tgttgcaaaa aaaaaaaagt gtctttgttt aaaattactt ggtttgtgaa tccatcttgc 180
tttttcccca ttggaactag tcattaaccc atctctgaac tggtagaaaa acatctgaag 240
agctagtcta tcagcatctg acaggtgaat tggatggttc tcagaaccat ttcacccaga 300
cagectgttt etateetgtt taataaatta gtttgggtte tetacatgea taacaaacce 360
tgctccaatc tgtcacataa aagtctgtga cttgaagttt agtcagcacc cccaccaaac 420
tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataaag tacccatgtc 480
ttta
<210> 435
<211> 424
<212> DNA
<213> Homo sapiens
<400> 435
gegeegetea gageaggtea etttetgeet tecaegteet eetteaagga ageeecatgt 60
gggtagcttt caatatcgca ggttcttact cctctgcctc tataagctca aacccaccaa 120
cgatcgggca agtaaaccc ctccctcgcc gacttcggaa ctggcgagag ttcagcgcag 180
atgggcctgt ggggagggg caagatagat gagggggagc ggcatggtgc ggggtgaccc 240
cttggagaga ggaaaaaggc cacaagaggg gctgccaccg ccactaacgg agatggccct 300
ggtagagace tttgggggte tggaacetet ggaeteecea tgetetaaet eccaeaetet 360
gctatcagaa acttaaactt gaggattttc tctgtttttc actcgcaata aattcagagc 420
aaac
<210> 436
<211> 667
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(667)
<223> n = A,T,C or G
<400> 436
accttgggaa nactctcaca atataaaggg tcgtagactt tactccaaat tccaaaaagg 60
tectggccat gtaateetga aagtttteee aaggtageta taaaateett ataagggtge 120
agcotottot ggaattooto tgatttoaaa gtotoactot caagttottg aaaacgaggg 180
cagtteetga aaggeaggta tageaactga tetteagaaa gaggaactgt gtgeaceggg 240
atgggctgcc agagtaggat aggattccag atgctgacac cttctggggg aaacagggct 300
gccaggtttg tcatagcact catcaaagtc cggtcaacgt ctgtgcttcg aatataaacc 360
```

```
tgttcatgtt tataggactc attcaagaat tttctatatc tctttcttat atactctcca 420
agttcataat gctgctccat gcccagctgg gtgagttggc caaatccttg tggccatgag 480
gatteettta tggggteagt gggaaaggtg teaatgggae tteggtetee atgeegaaac 540
accaaagtca caaacttcaa ctccttggct agtacacttc ggtctagcca gaaaaaaagc 600
agaaacaaga agccaaggct aaggcttgct gccctgccag gaggaggggt gcagctctca 660
tgttgag
<210> 437
<211> 693
<212> DNA
<213> Homo sapiens
<400> 437
ctacgtctca accctcattt ttaggtaagg aatcttaagt ccaaagatat taagtgactc 60
acacagccag gtaaggaaag ctggattggc acactaggac tctaccatac cgggttttgt 120
taaagctcag gttaggaggc tgataagctt ggaaggaact tcagacagct ttttcagatc 180
aggtactcct ctattttcac ccctcttgct tctactctct ggcagtcaga cctgtgggag 300
gccatgggag aaagcagctc tctggatgtt tgtacagatc atggactatt ctctgtggac 360
cattleteca ggttacceta ggtgteacta ttggggggac agecageate tttagettte 420
atttgagttt ctgtctgtct tcagtagagg aaacttttgc tcttcacact tcacatctga 480
acacctaact getgttgete etgaggtggt gaaagacaga tatagagett acagtattta 540
tectatttet aggeactgag ggetgtgggg tacettgtgg tgecaaaaca gateetgttt 600
taaggacatg ttgcttcaga gatgtctgta actatctggg ggctctgttg gctctttacc 660
ctgcatcatg tgctctcttg gctgaaaatg acc
                                                                 693
<210> 438
<211> 360
<212> DNA
<213> Homo sapiens
<400> 438
ctgcttatca caatgaatgt tctcctgggc agcgttgtga tctttgccac cttcgtgact 60
ttatgcaatg catcatgcta tttcatacct aatgagggag ttccaggaga ttcaaccagg 120
atgtttctac acctgtgggt tatgacaaag acaactgcca aagaatcttc aagaaggagg 180
actgcaagta tatctggtgg agaagaagga cccaaaaaag acctgttctg tcagtgaatg 240
gataatetaa tgtgetteta gtaggeacag ggeteecagg ceaggeetea tteteetetg 300
gcctctaata gtcaataatt gtgtagccat gcctatcagt aaaaagattt ttgagcaaac 360
<210> 439
<211> 431
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(431)
\langle 223 \rangle n = A,T,C or G
<400> 439
gtteetnnta acteetgeea gaaacagete teetcaacat gagagetgea ecceteetee 60
tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagaee 120
gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
gtcccattga cacctttccc actgacccca taaaggaatc ctcatggcca caaggatttg 240
gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attottgaat gagtootata aacatgaaca ggtttatatt cgaagcacag 360
acgttgaccg gactttgatg agtgctatga caaacctggc agcccgtcga cgcggccgcg 420
aatttagtag t
```

<210> 440

```
<211> 523
<212> DNA
<213> Homo sapiens
<400> 440
agagataaag cttaggtcaa agttcataga gttcccatga actatatgac tggccacaca 60
ggatcttttg tatttaagga ttctgagatt ttgcttgagc aggattagat aaggctgttc 120
tttaaatgtc tgaaatggaa cagatttcaa aaaaaaaccc cacaatctag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
cttctctcaa ggagaggcaa agaaaggaga tacagtggag acatctggaa agttttctcc 300
actggaaaac tgctactatc tgtttttata tttctgttaa aatatatgag gctacagaac 360°
taaaaattaa aacctetttg tgteeettgg teetggaaca tttatgttee ttttaaagaa 420
acaaaaatca aactttacag aaagatttga tgtatgtaat acatatagca gctcttgaag 480
tatatatatc atagcaaata agtcatctga tgagaacaag cta
<210> 441
<211> 430
<212> DNA
<213> Homo sapiens
<400> 441
gtteeteeta aeteetgeea gaaacagete teeteaacat gagagetgea eeetteetee 60
tggccagggc agcaagcctt agccttggct tcttgtttct gcttttttc tggctagacc 120
gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttcggcat ggagaccgaa 180
gtcccattga cacctttccc actgacccca taaaggaatc ctcatggcca caaggatttg 240
gccaactcac ccagctgggc atggagcagc attatgaact tggagagtat ataagaaaga 300
gatatagaaa attettgaat gagteetata aacatgaaca ggtttatatt egaagcacag 360
acgttgaccg gactttgatg agtgctatga caaacctggc agcccgtcga cgcggccgcg 420
aatttagtag
<210> 442
<211> 362
<212> DNA
<213> Homo sapiens
<400> 442
ctaaggaatt agtagtgttc ccatcacttg tttggagtgt gctattctaa aagattttga 60
tttcctggaa tgacaattat attttaactt tggtggggga aagagttata ggaccacagt 120
cttcacttct gatacttgta aattaatctt ttattgcact tgttttgacc attaagctat 180
atgtttagaa atggtcattt tacggaaaaa ttagaaaaat tctgataata gtgcagaata 240
aatgaattaa tgttttactt aatttatatt gaactgtcaa tgacaaataa aaattctttt 300
tgattatttt ttgttttcat ttaccagaat aaaaactaag aattaaaagt ttgattacag 360
tc
                                                                  362
<210> 443
<211> 624
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(624)
<223> n = A,T,C or G
<400> 443
ttttttttt gcaacacaat atacatcaca gtgaaatgtg taatccttgc aaattgcaag 60
```

BRICOGOLO JAIO DISABOORS I.

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ttgaaagaat taaattcaga ggaggggaga gaaagagtac tcagtaggga ctgagcacta 120
aatgcttatt ttaaaagaaa tgtaaagagc agaaagcaat tcaggctacc ctgccttttg 180
tgctggctag tactccggtc ggtgtcagca gcacgtggca ttgaacattg caatgtggag 240
cccaaaccac agaaaatggg gtgaaattgg ccaactttct attaacttgg cttcctgttt 300
tataaaatat tgtgaataat atcacctact tcaaagggca gttatgaggc ttaaatgaac 360
taacgcctac aaaacactta aacatagata acataggtgc aagtactatg tatctggtac 420
atggtaaaca teettattat taaagteaae getaaaatga atgtgtgtge atatgetaat 480
agtacagaga gagggcactt aaaccaacta agggcctgga gggaaggttt cctggaaaga 540
ngatgettgt getgggteca aatettggte tactatgace ttggecaaat tatttaaact 600
ttgtccctat ctgctaaaca gatc
<210> 444
<211> 425
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(425)
<223> n = A,T,C or G
<400> 444
gcacatcatt nntcttgcat tctttgagaa taagaagatc agtaaatagt tcagaagtgg 60
gaagetttgt ccaggectgt gtgtgaaccc aatgttttgc ttagaaatag aacaagtaag 120
ttcattgcta tagcataaca caaaatttgc ataagtggtg gtcagcaaat ccttgaatgc 180
tgcttaatgt gagaggttgg taaaatcctt tgtgcaacac tctaactccc tgaatgtttt 240
gctgtgctgg gacctgtgca tgccagacaa ggccaagctg gctgaaagag caaccagcca 300
cctctgcaat ctgccacctc ctgctggcag gatttgtttt tgcatcctgt gaagagccaa 360
ggaggcacca gggcataagt gagtagactt atggtcgacg cggccgcgaa tttagtagta 420
gtaga
                                                                   425
<210> 445
<21.1> 414
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1) ... (414)
<223> n = A,T,C or G
<400> 445
catgtttatg nttttggatt actttgggca cctagtgttt ctaaatcgtc tatcattctt 60
ttctgttttt caaaagcaga gatggccaga gtctcaacaa actgtatctt caagtctttg 120
tgaaattctt tgcatgtggc agattattgg atgtagtttc ctttaactag catataaatc 180
tggtgtgttt cagataaatg aacagcaaaa tgtggtggaa ttaccatttg gaacattgtg 240
aatgaaaaat tgtgtctcta gattatgtaa caaataacta tttcctaacc attgatcttt 300
ggatttttat aatcctactc acaaatgact aggcttctcc tcttgtattt tgaagcagtg 360
tgggtgctgg attgataaaa aaaaaaaaag tcgacgcggc cgcgaattta gtag
<210> 446
<211> 631
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(631)
```

```
<223> n = A,T,C or G
<400> 446
acaaattaga anaaagtgcc agagaacacc acataccttg tccggaacat tacaatggct 60
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atgetggtta taetggacaa caetgtgaaa aaaaggaeta eagtgtteta taegttgtte 180
ccggtcctgt acgatttcag tatgtcttaa tcgcagctgt gattggaaca attcagattg 240
ctgtcatctg tgtggtggtc ctctgcatca caagggccaa actttaggta atagcattgq 300
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gacagaagca aaatacaggg cactacagtt cagacaatac aacaagagcg tccacgaggt 420
taatctaaag ggagcatgtt tcacagtggc tggactaccg agagcttgga ctacacaata 480
cagtattata gacaaaagaa taagacaaga gatctacaca tgttgccttg catttgtggt 540
aatctacacc aatgaaaaca tgtactacag ctatatttga ttatgtatgg atatatttga 600
aatagtatac attgtcttga tgttttttct g
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<211> 585
<212> DNA
<213> Homo sapiens
<220>
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<222> (1) . . . (585)
\langle 223 \rangle n = A,T,C or G
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cctggccatg taatcctgaa agttttccca aggtagctat aaaatcctta taagggtgca 120
gcetettetg gaatteetet gattteaaag teteaetete aagttettga aaacgaggge 180
agttcctgaa aggcaggtat agcaactgat cttcagaaag aggaactgtg tgcaccggga 240
tgggctgcca gagtaggata ggattccaga tgctgacacc ttctqqqqqa aacaqqqctq 300
ccaggtttgt catagcactc atcaaagtcc ggtcaacgtc tgtgcttcga atataaacct 360
gttcatgttt ataggactca ttcaagaatt ttctatatct ctttcttata tactctccaa 420
gttcataatg ctgctccatg cccagctggg tgagttggcc aaatccttgt ggccatgagg 480
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ccaaagtcac aaacttcaac tccttggcta gtacacttcg gtcta
<210> 448
<211> 93
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(93)
<223> n = A, T, C or G
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tgctcgtggg tcattctgan nnccgaactg accntgccag ccctgccgan gggccnccat 60
ggctccctag tgccctggag agganggggc tag
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<210> 449
<211> 706
<212> DNA
<213> Homo sapiens
<221> misc_feature
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<222> (1)...(706)
\langle 223 \rangle n = A,T,C or G
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cctggagagg aggtgtctag tcagagagta gtcctggaag gtggcctctg ngaggagcca 180
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gtgctgcaag gcgattaagt tgggtaacgc cagggttttc ccagtcncga cgttgtaaaa 360
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cgtacgtaag cttggatect ctagagegge egectactae tactaaatte geggeegegt 480 >
cgacgtggga tccncactga gagagtggag agtgacatgt gctggacnct gtccatgaag 540
cactgagcag aagctggagg cacaacgcnc cagacactca cagctactca ggaggctgag 600
aacaggttga acctgggagg tggaggttgc aatgagctga gatcaggccn ctgcncccca 660
gcatggatga cagagtgaaa ctccatctta aaaaaaaaa aaaaaa
<210> 450
<211> 493
<212> DNA
<213> Homo sapiens
<400> 450
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aaatgaggct gagaacttta caaagggatc ttacagacat gtcgccaata tcactgcatg 180
agcctaagta taagaacaac ctttggggag aaaccatcat ttgacagtga ggtacaattc 240
caagtcaggt agtgaaatgg gtggaattaa actcaaatta atcctgccag ctgaaacqca 300
agagacactg tcagagagtt aaaaagtgag ttctatccat gaggtgattc cacagtcttc 360
tcaagtcaac acatctgtga actcacagac caagttctta aaccactgtt caaactctgc 420
tacacatcag aatcacctgg agagetttac aaactcccat tgccgagggt cgacgcggcc 480
gcgaatttag tag
                                                                   493
<210> 451
<211> 501
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(501)
<223> n = A,T,C or G
<400> 451
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ctcttcgcta ttacgccagc tggcgaaagg gggatgtgct gcaaggcgat taagttgggt 120
aacgccaggg ttttcccagt cncgacgttg taaaacgacg gccagtgaat tgaatttagg 180
tgacnetata gaagagetat gacgtegeat geacgegtae gtaagettgg atcetetaga 240
geggeegeet actactacta aattegegge egegtegaeg tgggateene actgagagag 300
tggagagtga catgtgctgg acnetgteca tgaagcactg agcagaaget ggaggcacaa 360
cgcnccagac actcacagct actcaggagg ctgagaacag gttgaacctg ggaggtggag 420
gttgcaatga gctgagatca ggccnctgcn ccccagcatg gatgacagag tgaaactcca 480
tcttaaaaaa aaaaaaaaa a
<210> 452
<211> 51
<212> DNA
<213> Homo sapiens
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<220>
 <221> misc_feature
 <222> (1)...(51)
 \langle 223 \rangle n = A,T,C or G
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                                                                    51
 <210> 453
 <211> 317
 <212> DNA
<213> Homo sapiens
<220>
<221> misc feature
<222> (1) . . . (317)
<223> n = A, T, C or G
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acatotgaag agotagtota toagoatotg goaagtgaat tggatggtto toagaacoat 120
ttcacccana cagcctgttt ctatcctgtt taataaatta gtttgggttc tctacatgca 180
taacaaaccc tgctccaatc tgtcacataa aagtctgtga cttgaagttt antcaqcacc 240
cccaccaaac tttatttttc tatgtgtttt ttgcaacata tgagtgtttt gaaaataagg 300
tacccatgtc tttatta
<210> 454
<211> 231
<212> DNA
<213> Homo sapiens
<400> 454
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taagccacgc cacgctcttg aaggagtctt gaattctcct ctgctcactc agtagaacca 120
agaagaccaa attettetge atcccagett gcaaacaaaa ttgttettet aggtetecae 180
ccttcctttt tcagtgttcc aaagctcctc acaatttcat gaacaacagc t
<210> 455
<211> 231
<212> DNA
<213> Homo sapiens
<400> 455
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cattgttccg aatgggcttt ccacaggcta cacacacaa acaggaaaca tgccaagttt 120
gtttcaacgc attgatgact tctccaagga tcttcctttg gcatcgacca cattcagggg 180
caaagaattt ctcatagcac agctcacaat acagggctcc tttctcctct a
<210> 456
<211> 231
<212> DNA
<213> Homo sapiens
<400> 456
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ttccattcag tattatcgtt attattcttg gagaaaccct gtctgtttac tgtaaccttt 120
tgcactcaaa ttcctttatc aggaataact acatagccac tatttacaaa gccattggaa 180
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<211> 231
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<213> Homo sapiens
<220>
<221> misc feature
<222> (1)...(231)
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tatttgattt tattagcaat etettteaga agaceettga gateattaag etttgtatee 180
agttgtctaa atcgatgcct catttcctct gaggtgtcgc tggcttttgt g
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<211> 231
<212> DNA
<213> Homo sapiens
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agaagagggg tggttaggga agccgttgag acctgaagcc ccaccctcta ccttccttca 120
acaccctaac cttgggtaac agcatttgga attatcattt gggatgagta gaatttccaa 180
ggtcctgggt taggcatttt ggggggccag accccaggag aagaagattc t
<210> 459
<211> 231
<212> DNA
<213> Homo sapiens
<400> 459
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cettegegaa acetgtggtg geceaecagt cetaaeggga eaggaeagag agaeagagea 120
gccctgcact gttttccctc caccacagec atcctgtccc tcattggctc tgtgctttcc 180
actatacaca gtcaccgtcc caatgagaaa caagaaggag caccctccac a
<210> 460
<211> 231
<212> DNA
<213> Homo sapiens
<400> 460
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cetateacce tattettggg ggetgettet teacagtgat catgaageet ageageaaat 120
cccacctccc cacacgcaca cggccagcct ggagcccaca gaagggtcct cctgcagcca 180
gtggagcttg gtccagcctc cagtccaccc ctaccaggct taaggataga a
<210> 461
<211> 231
<212> DNA
<213> Homo sapiens
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agggggattc catggcactg atagagccct atagtttcag agctgggaat t
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<211> 231
<212> DNA
<213> Homo sapiens
<400> 462
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gaagaactgt tagagagacc aacagggtag tgggttagag atttccagag tcttacattt 180
tctagaggag gtatttaatt tcttctcact catccagtgt tgtatttagg a
<210> 463
<211> 231
<212> DNA
<213> Homo sapiens
<400> 463
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<211> 231
<212> DNA
<213> Homo sapiens
<400> 464
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aaggacatca catatgaaga atgtttaagt tggaggtggc aacgtgaatt gcaaacaggg 120
cctgcttcag tgactgtgtg cctgtagtcc cagctactcg ggagtctgtg tgaggccagg 180
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<211> 231
<212> DNA
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aggatggcac aattittgct tgtgttcata atatactcag attagttcag ctccatcaga 180
                                                                231
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<211> 231
<212> DNA
<213> Homo sapiens
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cctgtgcaat caaatattgt ggagaattcc ctagctggag aagtcacaaa gactataggc 180
aataatggag accagtccca caagatgaca accagtcgtt gtgtgcggct g
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 <212> DNA
 <213> Homo sapiens
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 tgtgccttaa cagaaggtct tgagattcta agtgggaatc atttcagtga ctgtcatgtg 180
 gcatgggtct ctgcccaagc tcgtaatgag actatagcaa ggcggctgtg ggacgtcagt 240
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 <211> 3112
 <212> DNA
<213> Homo sapiens
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<212> DNA

<213> Homo sapiens

<400> 469

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aatggaatt
                                                                   2229
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<211> 2426
<212> DNA
<213> Homo sapiens
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caaaattcta aagcgcactc accatgaaat ggataaaggt tacctttggg gatttgcact 180
gcatgaattc tgtgaaaagc ttgttggata ttgtgataga gatagagaaa tgaagtatat 240 9
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ccataaacat tecetetgtg getettgeat tteatatatt tatetaaact ettataatea 360
aattacactt ttagtatttg ctgtctcatg tgatgatgaa tctcatatgt gtcccttctt 420
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<211> 140

<212> PRT

<213> Homo sapiens

<400> 477

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His Tyr His Arg Asp Thr Asp Thr Arg Arg His His His Met Asp Thr 20 25 30

Leu Ser His Tyr His Arg Asp Thr Arg His His Thr Val Thr Trp Thr 35 40 45

His His His Thr His Glu His Thr Asp Thr Leu Pro Tyr Gly His Trp 50 55 60

His Thr His Cys His Thr Val Thr Trp Thr His Leu His Thr Ile Thr 65 70 75 80

Pro Pro His Thr Leu Pro Val Asp Thr Arg Thr His Arg His Cys His
85 90 95

Thr Asp Thr Gln Asn Thr Val Thr Arg Arg His His His Ala Asp Thr
100 105 110

Pro Pro Leu Trp Cys Arg Leu Asn Tyr Pro Ala Gly Gly Thr Ala Val 115 120 125

Ala Tyr Ser Cys Leu Ser Asp Trp Leu Ser Pro Gln 130 135 140

<210> 478

<211> 143

<212> PRT

<213> Homo sapiens

<400> 478

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5 10 15

Ser His Gly His Thr Gly Ile Val Thr Trp Thr Asp Thr Gln Thr Tyr 20 25 30

Gly Glu Ile Thr Trp Thr His His His Thr Ile Thr Gly Thr Gln Thr
35 40 45

His Gly Asp Ile Thr Trp Thr His Cys His Thr Thr Gly Thr
50 55 60

Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr 65 70 75 80

Pro Thr His Cys His Met Asp Thr Gly Thr His Thr Ala Thr Leu Ser 85 90 95 His Gly His Thr Ser Thr Pro Ser His His His Thr His Cys Leu Trp
100 105 110

Thr Gln Gly His Thr Asp Thr Val Thr Gln Ile His Lys Thr Leu Ser 115 120 125

His Gly Asp Ile Thr Met Gln Ile His His Ser Gly Ala Val 130 135 140

<210> 479

<211> 222

<212> PRT

<213> Homo sapiens

<400> 479

Met Tyr Arg His Thr Glu Thr Leu Pro His Gly Asp Thr Val Thr Gln 5 10 15

Ser His Glu His Thr Gly Ile Val Thr Trp Thr Asp Thr Gln Thr Tyr
20 25 30

Gly Glu Ile Thr Leu Thr His His His Thr Ile Thr Gly Thr Gln Thr 35 40 45

His Gly Asp Ile Thr Trp Thr His Cys His Thr Thr Gly Thr 50 55 60

Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr 65 70 75 80

Pro Thr His Cys His Met Asp Thr Ala Thr His Thr Ala Thr Leu Ser 85 90 95

His Gly His Thr Ser Ile Pro Ser His His His Thr His Cys His Val

Asp Thr Arg Thr His Arg His Cys His Thr Asp Thr Gln Asn Thr Val

Thr Arg Arg His His His Ala Asp Thr Pro Pro His Gly His Ser Thr 130 135 140

Arg His Ser Ala Thr Gln Ile His His His Thr Glu Met Arg Thr His 145 150 155 160

Cys His Thr Asp Thr Thr Ser Leu Pro His Phe His Val Ser Ala 165 170 175

Gly Gly Val Gly Pro Thr Thr Leu Gly Ser Asn Arg Glu Ile Thr Trp 180 185 190

Thr Tyr Ser Glu Gly Lys Ile Phe Phe Tyr Phe Leu Gly Asn Gln Ala 195 200 205

Arg Leu Cys Leu Lys Lys Arg Lys Lys Gln Tyr Thr Val 210 215 220 <210> 480

<211> 144

<212> PRT

<213> Homo sapiens

<400> 480

Met Glu Pro Tyr Arg Gly Asn Glu Gln Pro Ser Gln Glu Gln Gly Val
5 10 15

Cys Cys Leu Trp Gly Leu Gln Ser Leu Pro Gln Gly Ser Tyr Val Thr 20 25 30

Val Gly Phe Leu Val Val Lys Arg Gln Thr Ile Gly Arg Leu Glu Arg 35 40 45

Asp Phe Met Phe Lys Cys Arg Lys Gln Pro Gly Leu Pro Pro Ser Gly 50 55 60

Leu Cys Leu Leu Trp Pro Trp Pro Asn Leu Glu Phe Gly Arg Arg Gln 65 70 75 80

Asp Arg Leu Thr Trp Ser Ser Val Ser Val Ala Gly Val Cys Ala Cys 85 90 95

Arg Ala Arg Pro Gly Trp Leu Gly Glu Gln Pro Ala Thr Ser Ala Gly
100 105 110

Val Arg Leu Glu Gln Val Glu Gln Pro Pro Ala His Pro Leu Gln Glu
115 120 125

Ala Gly Val Ala Arg Phe Pro Arg Pro Glu Trp Val Pro Pro Asn Gly 130 135 140

<210> 481

<211> 167

<212> PRT

<213> Homo sapiens

<400> 481

Met His Gly Pro Gln Val Leu Ala Arg Cys Ser Glu Cys Ala Cys Pro 5 10 15

Ala Leu Ala Ala Thr Ser Ala Gly Val Arg Leu Glu Gly Val Asp Arg
20 25 30

Pro Pro Thr Leu Pro Ser Gln Gly Ser Gly Trp Pro Cys Ser His Ser 35 40 45

Leu Ser Gly Cys His Leu Met Ala Asp Gly Ala Lys Ala Leu Gly Lys
50 60

Ala Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr Asp Val Pro

v.2.

65	70	75	80

Cys Pro Ala Ala Ser Glu Val Gly Gly Cys Ala Pro Ser Ser Trp Arg 85 90 95

Ala Leu Ala Glu Val Thr Gly Cys Ser Leu Gly Pro Leu Gly Leu Ala 100 105 110

Gln His Ala Gln Ala Ser Val Leu Leu Cys Tyr Lys Trp Ser His 115 120 125

Ile Gly Glu Thr Ser Ser His Leu Arg Ser Lys Val Tyr Ala Ala Phe 130 135 140

Gly Gly Ser Ser Pro Cys Leu Lys Gly Leu Met Ser Leu Trp Ala Ser 145 150 155 160

Trp Leu Ser Arg Gly Arg Pro 165

<210> 482

<211> 143

<212> PRT

<213> Homo sapiens

<400> 482

Met Glu Pro Tyr Arg Gly Asn Lys Lys Gln Val Gln Glu Lys Gly Val
5 10 15

Pro Cys Leu Trp Gly Ser Ser Pro Cys Leu Arg Cys His Met Ala Leu 20 25 30

Arg Ala Ser Trp Leu Pro Gly Gly Gly Pro Gln Ala Ile Leu Gly Arg

Thr Leu Cys Ser Ser Ala Glu Ser Ser Gln Asp Cys His Pro Gly Gly 50 55 60

Pro Ser Ile Ala Leu Ala Lys Pro Cys Arg Gly Val Trp Leu Leu Phe 65 70 75 80

Glu Pro Ala Trp Pro Pro Trp His Ala Arg Ala Pro Gly Ala Gly Thr 85 90 95

Leu Leu Arg Val Cys Leu Ser Cys Leu Gly Cys His Leu Cys Gly Gly
100 105 110

Ala Ser Gly Gly Gly Pro Ala Thr Asn Leu Thr Gln Ser Arg Lys
115 120 125

Trp Met Ala Met Phe Pro Gln Pro Glu Trp Leu Pro Pro Asp Gly
130 140

<210> 483

<211> 143

<212> PRT

31

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<213> Homo sapiens
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<400> 483

Met Glu Thr Gln Arg Gly Asn Lys Gln Arg Ala Gln Glu Gln Gly Val
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Cys Cys Leu Trp Gly Ser Ser Pro Cys Leu Gly Ser Tyr Gly Thr Ala
20 25 30

Gly Phe Leu Val Ala Lys Arg Arg Thr Thr Gly Leu Leu Glu Glu Asp 35 40 45

Phe Thr Phe Lys Cys Arg Lys Gln Pro Lys Leu Pro Ser Met Arg Leu 50 60

Ser Leu Leu Trp Pro Trp Arg Asp Leu Lys Phe Val Pro Arg Gln Asp 65 70 75 80

Lys Leu Thr Arg Ser Ser Val Ser Val Ala Gly Ala Tyr Ala Cys Arg 85 90 95

Ala Gly Pro Gly Trp Leu Lys Glu Gln Pro Ala Thr Ser Ala Arg Val 100 105 110

Arg Leu Val Gln Ala Glu His Pro Pro Pro His Pro Leu Glu Glu Val

Gly Met Ala Arg Phe Pro Gln Pro Glu Cys Leu Pro Pro Tyr Cys 130 135 140

<210> 484

<211> 30

<212> PRT

<213> Homo Sapien

<400> 484

Thr Ala Ala Ser Asp Asn Phe Gln Leu Ser Gln Gly Gln Gly Phe

1 5 10 15 .

Ala Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile
20 25 30

<210> 485

<211> 31

<212> DNA

<213> Artificial Sequence

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<223> Made in a lab

<400> 485

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<210> 486

<211> 27

<212> DNA

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      <220>
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      <400> 487
cccgaattct tagctgccca tccgaacgcc ttcatc
                                                                         36
      <210> 488
      <211> 33
      <212> DNA
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
     ·<400> 488
gggaagcttc ttccccggct gcaccagctg tgc
                                                                         33
      <210> 489
      <211> 19
      <212> PRT
      <213> Artificial Sequence
      <223> Made in a lab
      <400> 489
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Ser Val Ala
      <210> 490
      <211> 20
      <212> PRT
      <213> Artificial Sequence
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      <223> Made in a lab
      <400> 490
Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala Thr Cys
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Leu Ser His Ser
      <210> 491
      <211> 20
      <212> PRT
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PARCOCIO- JAMO - MISAROSAS I -

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<213> Artificial Sequence
      <220>
      <223> Made in a lab
Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu
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Thr Gly Phe Thr
            20
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      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 492
Ala Leu Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr
                                   10
Leu Ala Ser Leu
            20
      <210> 493
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 493
Tyr Thr Leu Ala Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro
                                    10
Lys Tyr Arg Gly
            20
      <210> 494
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 494
Leu Pro Lys Tyr Arg Gly Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser
Leu Met Ile Ser
            20
      <210> 495
      <211> 20
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      <213> Artificial Sequence
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<220>
      <223> Made in a lab
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Phe Pro Asn Gly
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      <210> 496
      <211> 21
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 496
Ala Pro Phe Pro Asn Gly His Val Gly Ala Gly Gly Ser Gly Leu Leu
                                    10
Pro Pro Pro Pro Ala
          20
      <210> 497
      <211> 20
      <212> PRT
      <213> Artificial Sequence
      <223> Made in a lab
      <400> 497
Leu Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser Ala Cys Asp Val
                       . 10
Ser Val Arg Val
           20
      <210> 498
      <211> 20
      <212> PRT
      <213> Artificial Sequence .
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      <223> Made in a lab
     <400> 498
Asp Val Ser Val Arg Val Val Gly Glu Pro Thr Glu Ala Arg Val
                                  10
Val Pro Gly Arg
           20
     <210> 499
     <211> 20
     <212> PRT
     <213> Artificial Sequence
     <220>
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<223> Made in a lab
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Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp
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                                    10
Ser Ala Phe Leu
            20
      <210> 500
      <211> 20
      <212> PRT
      <213> Artificial Sequence
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      <223> Made in a lab
      <400> 500
Leu Asp Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met
                                   10
Gly Ser Ile Val
      <210> 501
      <211> 20
      <212> PRT
      <213> Artificial Sequence
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      <223> Made in a lab
      <400> 501
Phe Met Gly Ser Ile Val Gln Leu Ser Gln Ser Val Thr Ala Tyr Met
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                                                         15
Val Ser Ala Ala
            20
      <210> 502
      <211> 414
      <212> DNA
      <213> Homo Sapien
      <220>
      <221> misc_feature
      <222> (1)...(414)
      <223> n = A,T,C or G
      <400> 502
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tcagtcggtg gaggagtccg ggggtcgcct ggtcacgcct gggacacctt tgacantcac
                                                                      120
ctgtagagtt tttggaatng acctcagtag caatgcaatg agctgggtcc gccaggctcc
                                                                      180
agggaagggg ctggaatgga tcggagccat tgataattgt ccacantacg cgacctgggc
                                                                      240
gaaaggccga ttnatnattt ccaaaacctn gaccacggtg gatttgaaaa tgaccaqtcc
                                                                      300
gacaaccgag gacacggcca cctatttttg tggcagaatg aatactggta atagtggttg
                                                                      360
gaagaatatt tggggcccag gcaccctggt caccgtntcc tcaqqqcaac ctaa
                                                                      414
      <210> 503
      <211> 379
      <212> DNA
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<213> Homo Sapiens
        <220>
        <221> misc_feature
        <222> (1) ... (379)
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                                                                         120
 agctatggag tgagctgggt ccgccaggct ccagggaagg ggctggnata catcggatca
                                                                         180
 ttagtagtag tggtacattt tacgcgagct gggcgaaagg ccgattcacc atttccaaaa
                                                                         240
 cctngaccac ggtggatttg aaaatcacca gtttgacaac cgaggacacg gccacctatt
                                                                         300
 tntgtgccag aggggggttt aattataaag acatttgggg cccaggcacc ctggtcaccg
                                                                         360
 tntccttagg gcaacctaa
                                                                         379
       <210> 504
       <211> 19
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 504
 Gly Phe Thr Asn Tyr Thr Asp Phe Glu Asp Ser Pro Tyr Phe Lys Glu
  1
                                     10
 Asn Ser Ala
       <210> 505
       <211> 20
       <212> PRT
       <213> Artificial Sequence
       <220>
      <223> Made in a lab
      <400> 505
Lys Glu Asn Ser Ala Phe Pro Pro Phe Cys Cys Asn Asp Asn Val Thr
 1
                                     10
Asn Thr Ala Asn
      <210> 506
      <211> 407
      <212> DNA
      <213> Homo Sapien
      <400> 506
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tegetggagg agteeggggg tegeetggte aegeetggga caeecetgae aeteaeetge
                                                                       120
acceptetete gattetecet cagtageaat geaatgatet gggteegeea ggeteeaggg
                                                                       180
aaggggctgg aatacatcgg atacattagt tatggtggta gcgcatacta cgcgagctgg
                                                                       240
gtgaaaggcc gattcaccat ctccaaaacc tcgaccacgg tggatctgag aatgaccagt
                                                                       300
ctgacaaccg aggacacggc cacctatttc tgtgccagaa atagtgattt tagtggtatg
                                                                       360
ttgtggggcc caggcaccct ggtcaccgtc tcctcagggc aacctaa
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<210> 507
       <211> 422
       <212> DNA
       <213> Homo Sapien
       <400> 507
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teggtggagg agteeggggg tegeetggte aegeetggga cacceetgae acteacetgt
                                                                        120
acagtetetg gatteteect cageaactae gacetgaact gggteegeea ggeteeaggg
                                                                        180
aaggggctgg aatggatcgg gatcattaat tatgttggta ggacggacta cgcgaactgg
                                                                        240
gcaaaaggcc ggttcaccat ctccaaaacc tcgaccaccg tggatctcaa gatcgccagt
                                                                       , 300
ccgacaaccg aggacacggc cacctatttc tgtgccagag ggtggaagtg cgatgagtct
                                                                        360
ggtccgtgct tgcgcatctg gggcccaggc accctggtca ccgtctcctt agggcaacct
                                                                        420
                                                                        422
aa
       <210> 508
       <211> 411
       <212> DNA
       <213> Homo Sapiens
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       <221> misc feature
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       <400> 508
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                                                                        120
 cggtggagga gtccgggggt cgcctggtca cgcctgggac acccctgaca ctcacctgca
 cagtetetgg aategacete agtagetact geatgagetg ggteegeeag geteeaggga
                                                                        180
 aggggctgga atggatcgga atcattggta ctcctggtga cacatactac gcgaggtggg
                                                                        240
 cgaaaggccg attcaccatc tccaaaacct cgaccacggt gcatntgaaa atcnccagtc
                                                                        300
                                                                        360
 cgacaaccga ggacacggcc acctatttct gtgccagaga tcttcgggat ggtagtagta
                                                                        4.11
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       <210> 509
       <211> 15
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 509
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                                    10
       <210> 510
       <211> 15
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 510
 Pro Glu Tyr Asn Arg Pro Leu Leu Ala Asn Asp Leu Met Leu Ile
                                      10
                                                          15
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<210> 511
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       <223> Made in a lab
       <400> 511
 Tyr His Pro Ser Met Phe Cys Ala Gly Gly Gln Asp Gln Lys
                                     10
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       <211> 15
       <212> PRT
       <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 512
Asp Ser Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu
                                     10
      <210> 513
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 513
Ala Pro Cys Gly Gln Val Gly Val Pro Asx Val Tyr Thr Asn Leu
                                    10
      <210> 514
      <211> 15
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 514
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Ala Ser
                5
                                    10
     <210> 515
     <211> 15
     <212> PRT
     <213> Artificial Sequence
     <220>
     <223> Made in a lab
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<400> 515 Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg <210> 516 <211> 15 <212> PRT <213> Artificial Sequence <220> <223> Made in a lab <400> 516 Val Ser Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln <210> 517 <211> 15 <212> PRT <213> Artificial Sequence <223> Made in a lab <400> 517 Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met 10 <210> 518 <211> 15 <212> PRT <213> Artificial Sequence <223> Made in a lab <400> 518 Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly 10 <210> 519 <211> 17 <212> PRT <213> Artificial Sequence <220> <223> Made in a lab <400> 519 Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg Asn Tyr Asp Glu Gly Cys 5 1 Gly

<210> 520 <211> 25 <212> PRT <213> Artificial Sequence

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<220>
      <223> Made in a lab
      <400> 520
Val Gly Glu Gly Leu Tyr Gln Gly Val Pro Arg Ala Glu Pro Gly Thr
Glu Ala Arg Arg His Tyr Asp Glu Gly
      <210> 521
      <211> 21
      <212> PRT
      <213> Artificial Sequence
      <220>
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Phe Thr Gln Val
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Asn Gly Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu
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 Trp Val Leu Ser Ala Thr His Cys Phe Gln Asn Ser Tyr Thr Ile Gly
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 Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
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 Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
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                                                  125
 Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
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                                              140
 Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg
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 Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
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                             200
                                                  205
 Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
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 25
 30

 Asn Gly Glu Asp Cys Ser Pro His Ser Gln Pro Trp Gln Ala Ala Leu

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Leu Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met
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Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
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Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
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Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
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                                            140
Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg
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Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu
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Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
                                185
Ala Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly
Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
                        215
Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn Leu
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- Met Tyr Val Val Ala Met Phe Gly Asn Cys Ile Val Val Phe Ile Val 35 40 45
- Arg Thr Glu Arg Ser Leu His Ala Pro Met Tyr Leu Phe Leu Cys Met 50 55 60
- Leu Ala Ala Ile Asp Leu Ala Leu Ser Thr Ser Thr Met Pro Lys Ile 65 70 75 80
- Leu Ala Leu Phe Trp Phe Asp Ser Arg Glu Ile Ser Phe Glu Ala Cys
  85 90 95
- Leu Thr Gln Met Phe Phe Ile His Ala Leu Ser Ala Ile Glu Ser Thr
  100 105 110
- Ile Leu Leu Ala Met Ala Phe Asp Arg Tyr Val Ala Ile Cys His Pro 115 120 125
- Leu Arg His Ala Ala Val Leu Asn Asn Thr Val Thr Ala Gln Ile Gly 130 135 140
- Ile Val Ala Val Val Arg Gly Ser Leu Phe Phe Phe Pro Leu Pro Leu 145 150 155 160
- Leu Ile Lys Arg Leu Ala Phe Cys His Ser Asn Val Leu Ser His Ser
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  - Tyr Cys Val His Gln Asp Val Met Lys Leu Ala Tyr Ala Asp Thr Leu 180 185 190
  - Pro Asn Val Val Tyr Gly Leu Thr Ala Ile Leu Leu Val Met Gly Val
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  - Asp Val Met Phe Ile Ser Leu Ser Tyr Phe Leu Ile Ile Arg Thr Val 210 215 220
  - Leu Gln Leu Pro Ser Lys Ser Glu Arg Ala Lys Ala Phe Gly Thr Cys 225 230 235 240
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    245 250 255
  - Leu Ser Val Val His Arg Phe Gly Asn Ser Leu His Pro Ile Val Arg 260 265 270
  - Val Val Met Gly Asp Ile Tyr Leu Leu Pro Pro Val Ile Asn Pro 275 280 285
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170

165

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 Gln Lys Gln Gln Val Val Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu
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 Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Leu Glu Gln Asn Val Asp
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Ala Lys Arg Pro Thr Thr Gly His Leu Glu Lys Glu Phe Met Phe His 50 55 60

Cys Arg Lys Gln Pro Gly Ser Pro Ser Arg Gly Leu Gly Leu Leu Trp
65 70 75 80

Pro Trp Pro Asp Ile Glu Phe Val Pro Arg Gln Asp Lys Leu Thr Gln 85 90 95

Ser Ser Val Leu Val Pro Gln Ile Cys Ala Cys Gln Thr Arg Pro Asn 100 105 110

Trp Leu Asn Glu Gln Pro Ala Thr Ser Ala Gly Val Arg Leu Glu Glu
115 120 125

Val Asp Gln Pro Pro Thr Leu Pro Ser Gln Gly Ser Gly Trp Pro Cys 130 135 140

Ser His Ser Leu Ser Gly Cys His Leu Met Ala Asp Ile Ala Lys Ala 145 150 155 160

Leu Gly Lys Ala Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr 165 170 175

Asp Val Pro Cys Pro Ala Ala Ser Glu Val Gly Gly Cys Ala Pro Ser 180 185 190

Ser Trp His Thr Leu Ala Glu Val Thr Gly Cys Ser Leu Ser Pro Leu 195 200 205

Ser Leu Ala Gln His Ala Gln Ala Ser Val Leu Leu Cys Tyr Lys 210 215 220

Trp Ser His Ile Gly Glu Thr Ser Ser His Leu Arg Ser Lys Val Tyr 225 230 235 240

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<212> DNA

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Lys Thr Thr Gly Gln Ile Val Asn Leu Leu Ser Asn Asp Val Asn 145 150 155 160

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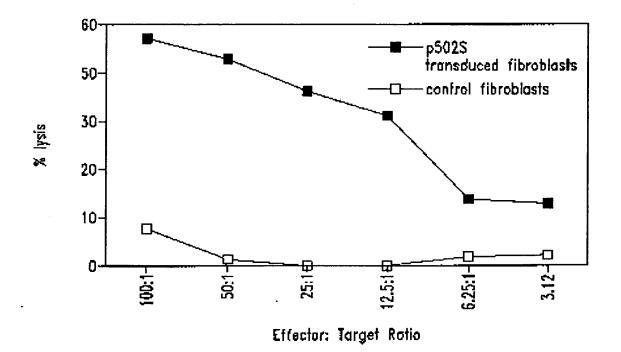


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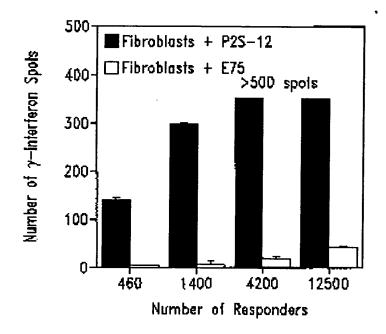


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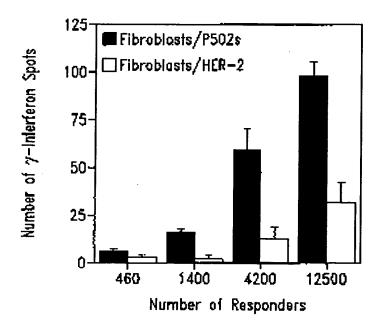


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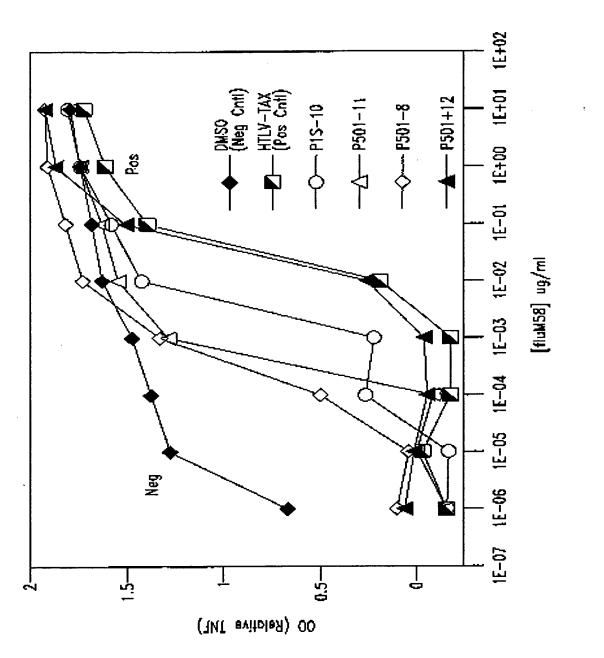


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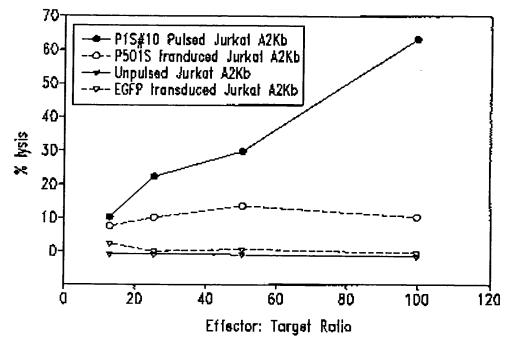


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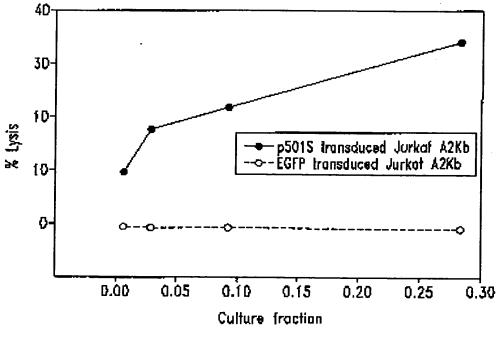
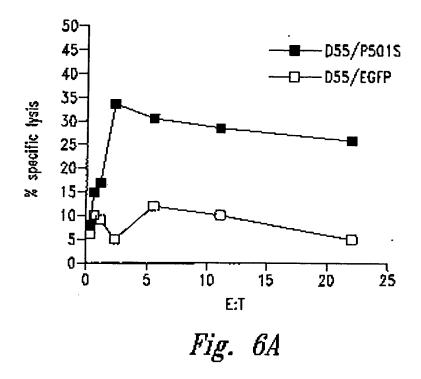
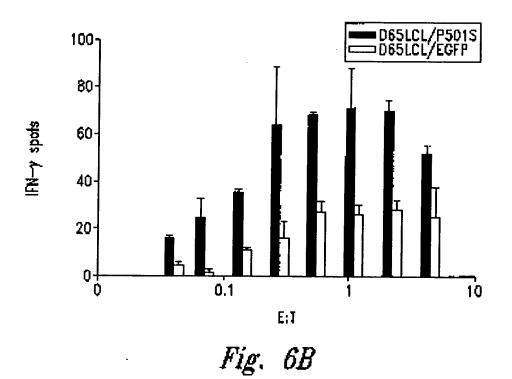
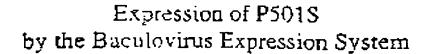


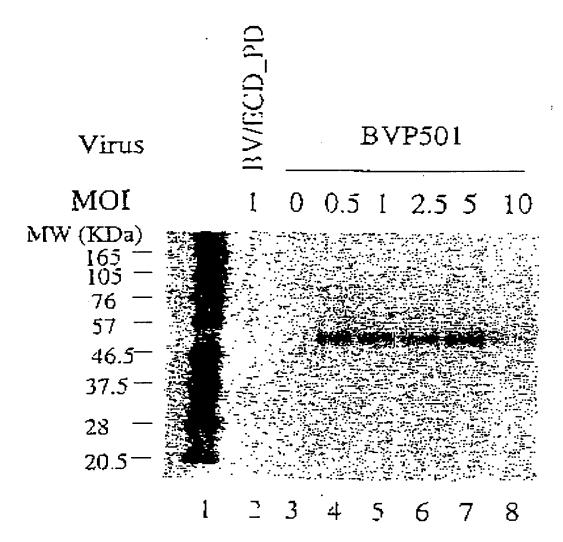
Fig. 5





WO 01/34802 PCT/U800/30904

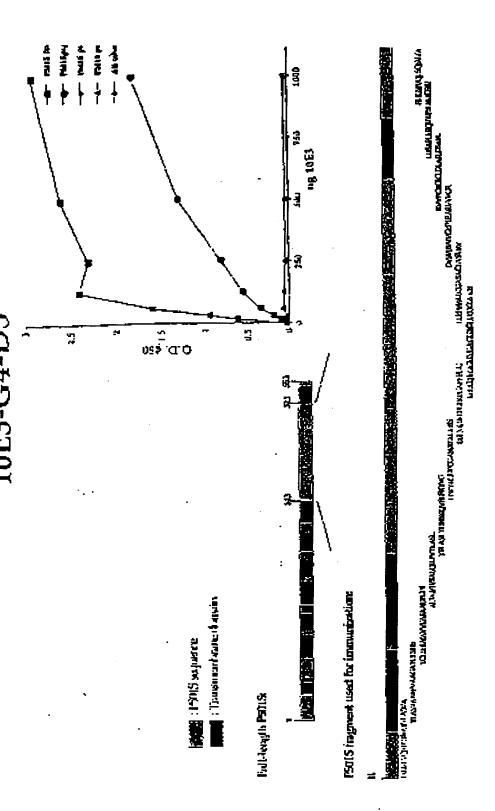




0.6 million high 5 relis at 5-well place were infected with an unrelated control virus BV/ECD\_PD (later I is a)thour virus (lane 3), or with recombinant baculovirus for P501 at different NDIs (lane 4 - 8). Call lyantes were run on SDS-PAGE under the reducing conditions and analyzed by Western blot with a monoclonal antibody against P50 3 (F501S-10E)-G4D3). Lane 1 is the biodinylated protein molecular weight market. Subjuces.

Fig. 7

## Figure 8. Mapping of the epitope recognized by 10E3-G4-D3



7/10

Fig. 8

Schematic of P501S with predicted transmembrane, cytoplasmic, and extracellular regions

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HQI CCRMPRTLRR LFVAELCSWMALMTFTLFYTDF VGEGLYQGVPRAEPGTEARRHYDEGVR

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VTAYMVSAAGLGLVAIYFAT QVVFDKSDLAKYSA

<u>Underlined sequence</u>: Predicted transmembrane domain; **Bold sequence**: Predicted extracellular domain; *Italic sequence*: Predicted intracellular domain. Sequence in bold/underlined: used generate polyclonal rabbit serum

Localization of domains predicted using HMMTOP (G.E. Tushady an I. Simon (1998) Principles Governing Amino Acid Composition of Integral Membrane Proteins: Applications to topology Prediction. J. Mol Biol. 283. 489-506.

Fig. 9

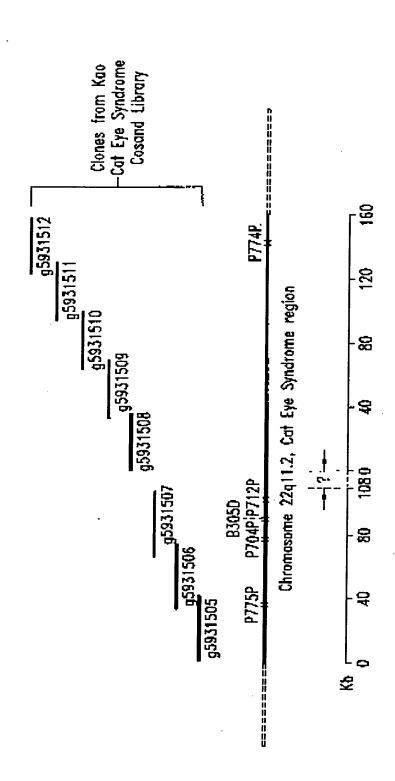


Fig. 10

Elisa assay of rabbit polyclonal antibody specificity

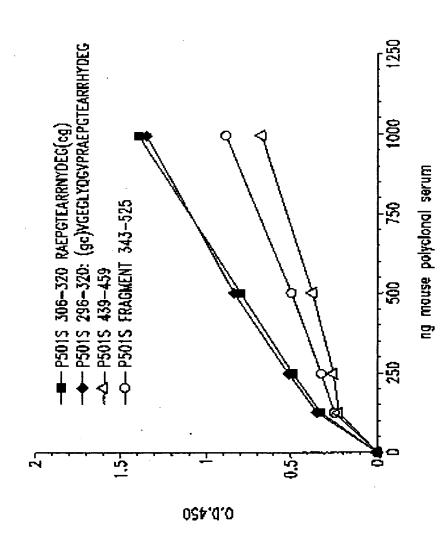


Fig. 11

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geogecacog eggiggaget coagettitg treecttiag tgagggitaa tigegogett
                                                                       480
ggogtaatca tggtcatago tgtttcctgt gtgaaattgt tatccgctca caattcccco
                                                                       540
azcatacyay coygaacata aagtyttaay ootyyyytyo otaatyanty ayotaacton
                                                                       600
catteattgc gttgcgctca otgcccgctt tccagtcggg aaaactgtcg tgccactgcn
                                                                       660
ttantgaatc ngccacccc ogggasaagg oggttgentt ttgggootet teegetttee
                                                                       720
togotoatty atcoingene coggitating goigoggnga acggitaaci coicaaaggo
                                                                       780
ggtntnecgg ttatececaa aenggggata ecenga
                                                                       P16
      <210 × 3
      <211> 773
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(773}
      <223> n = A,T,C or G
      <400> 3
cttttgaaag aagggatggc tggggtgttt aacagcagag gtgcagggcg ggggctcacg
                                                                        60
tertgeteet caetggtgat aaaogageee egtteettgt tgtgateatg atgaacaace
                                                                       120
tortcaaaag tragaacegg agtwacacag goatetgtgr cgtcaaagat ttgacaccac
                                                                       180
totgoottog tottotttgc aaatacatot gcaaacttot tottoattto tggccaatca
                                                                       240
tocatgotca totgattggg aagttcatca gactttagto cannicotti gatcagcage
                                                                       30D
togtagaact ggggttotat tgctccaaca gccatgaatt coccatctgc tgtcctgtaa
                                                                       360
gtcgtatege eegstgctcc eccepccaac atgttctgtc ctcgaggggg ggcccggtac
                                                                       420
ccaattcgcc ctatantgag tcgtattacg cgcgctcact ggccgtcgtt ttacaacgtc
                                                                       480
gigaciggga aaaccoliggg cgitaccaac tiaalcgeet igcagcacai ccecciticg
                                                                       540
ccagctgggc gtaatancga aaaggccogc accgatcgcc cttccaacag ttgogcacct
                                                                       600
gaatgrana atgggaeece cetgttaeeg egeatinaac cecegenggg titngtigti
                                                                       66Q
Accordacht nnacogotta captitgora gegesttans georgetoss titonsotti
                                                                       720
efficients thichenen efficeeeg gggttfeegg chteaaacce ena
                                                                       773
      <210> 4
      <211> 828
      <2125 DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1)...[828]
      <223> n = A, T, C or G
```

```
<400> 4
ceteetgagt cetaetgace tgtgetttet ggtgtggagt ceagggetge taggaatagg
                                                                          60
 aatgggcaga cacaggtgta tgccaatgtt tctgaaatgg gtataatttc gtcctctcct
                                                                         120
 toggaacact ggotgtotot gaagacttot ogotcagttt cagtgaggac acacacaaag
                                                                         18D
 acgigggiga ccalgitgit igiggggigc agagaiggga ggggiggggc ccacccigga
                                                                         24D
 agagtggaca gtgacacaag gtggacacto totacagato actgaggata agotggagoo
                                                                         300
 BCABTGCATG AGGCACAC ACAGCAAGGA tgacxCtgta aacatagccc acgctgtcct
                                                                         360
 gngggcactg ggaagcctan atnaggccgt gagcanaaag aaggggagga tccactagtt
                                                                         420
 ctanagoggo byccacogby gtgyanotoc anottttytt coctttagty aggyttaatt
                                                                         480
gegegettgg entaateatg greatanern tercetgrer gaaartgeta teegereaca
                                                                        . 540
 attecacaca acataegane eggaaacata aantgtaaae etggggtgee taatgantga
                                                                        600
 ctaactcaca ttaattgegt tgegeteaet gedegettte caatenggaa acetgtettg
                                                                        660
 concitignat insignation godescoold ggggaasage gittigegitt inggegetet
                                                                        720
teogetteet encteantia nicectnene teggicatic eggetgenge aaaceggite
                                                                        780
accnecteca aagggggtat teeggtttee cenaateegg ggananee
                                                                        828
       c210> 5
       <211> 834
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {l}...(834)
      \langle 223 \rangle n = A,T,C or G
      <400> 5
tttttttttt tttttactga tagatggaat ttattaaget tttcacetgt gatagcecat
                                                                         60
agtittaatt goatoosaag taotaacasa sactotagoa atcaagaatg goagostgtt
                                                                        120
atttataan aatcaacaen totoocttt aaaatttoot tttoataaga taatttatan
                                                                        180
tgaagtmaat ctagccatgc ttttmaamma tgctttaggt cactccmagc ttggcagttm
                                                                        240
acatitggca taaacaataa taaaacaato acaatttaat aaxtaacaaa tacaacattg
                                                                        3 D a
taggccataa tcatatacag tataaggama aggtggtagt gttgagtaag cagttattag
                                                                        35D
astagestac chiggodich atgrasstat gictagacac bitgaticac beagecetga
                                                                        420
cattcagttt treaagtagg agaraggttr teregtatre tittaragtt trraacerat
                                                                        480
tgaaaacaag tagaaaatga tgagttgatt tttattaatg cattacatcc tcaagagtta
                                                                        54 D
teaccaacce eteagtiata aasaattiic aagitatatt agicatataa etiggigige
                                                                        бQD
ttattttasa ttagtgotaa atggattaag tgaagacaac aatggtcccc taatgtgatt
                                                                        660
gatatiggic attitiacca gctictaaat cinaactiic aggctitiga actggaacat
                                                                        720
tgnatnacag tgttccanag ttncaaccta etggaacatt acagtgtgct tgattcaaaa
                                                                        780
tgttattttg ttaamaatta aattttaacc tggtggamaa ataatttgaa atma
                                                                        834
      <21D> 6
      <211> 818
      <212> DNA
      <213> Homo sapies
      <220>
      <221> misc feature
      <222> (1)...[818]
      \langle 223 \rangle n = A, Y, C or G
      <400> 6
ttittitit tittittit aagaeeetea teaatagatg gagaeataea gaaatagtea
                                                                        6O
asccacatot acasaatgoo agtatoaggo ggoggottog aagccaaagt gatgtttgga
                                                                       120
tgtaaagtga aatattagtt ggcggatgaa gcagatagtg aggaaagttg agccaataat
                                                                       180
ga¢gtgaagt cogtggaage etgtggetae aaaaaatgtt gageegtaga tgeogtogga
                                                                       240
aatgatgaag ggagaotoga agtactotga ggottgtagg agggtaazat agagacocag
                                                                       300
```

```
taaaattgta ataagcagtg citgaattat tiggittigg tigtiticta tiagactatg
                                                                       360
głącącteką głąchigata otociącie gagiastkog gaigigita ggagiącąc
                                                                       420
ttctagggga tttagcgggg tgatgcetgt tgggggecag tgccetecta gttggggggt
                                                                       480
aggggctagg ctggmgtggt mamaggctca gmammatcct gcgmagmama amacttctgm
                                                                       540
ggtaataaat aggattatoo ogtatogaag goottittegg acaggtegte tetegtegeo
                                                                       600
tiggitatgig officiogig tiacatogog coalcatigg tafatgitta gigtgftiggg
                                                                       660
ttantangge etantatgaa gaactttteg antggaatta aateaatnge ttggeeggaa
                                                                       720
gtcattanga nggctnaaaa ggccctgtta ngggtctggg ctnggtttta cccnacccat
                                                                       780
ggaatnonee eeeeggaena ntgnateeet attettaa
                                                                       818
      <210> 7
      <211> 917
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...(817)
      <223> n = A,T,C or G
      <400> 7
ttttttttt ttttttttt tggctctaga gggggtagag ggggtgctat agggtaæata
                                                                        60
cgggccctat ttcaaagatt tttaggggaa ttaattctag gacgatgggt atgaaactgt
                                                                       120
gätttäetee acagattiea gageattgae egtagtatae ecceggiogi gtagoggiga
                                                                       180
asgtggtttg gtttsgacgt ccgggaattg catctgtttt taagectaat gtggggacag
                                                                       240
ctcatgagtg caagacgtct tgtgatgtaa ttattatacn aatgggggct tcaatoggga
                                                                       300
gtactactcg attgtcaacg tcaaggagtc gcaggtcgcc tggttctagg aataatgggg
                                                                       350
geagtatgta ggaattgaag attaatoogo ogtagtoggt gttotoctag gttosataco
                                                                       420
att99tggcc aattgatttg atggtaaggg gagggatogt tgaactcgtc tgttatgtaa
                                                                       480
aggathdott ngggatgga aggchatnaa ggactangga thaatggogg gcangatatt
                                                                       540
trasacrigte tetaniticet gasacritety sastritaat asnastisan titrigitati
                                                                       600
gastnitnng gasaagggot tacaggacta gasaccaaat angasaanta atnnisangg
                                                                       660
enttatentn aaaggtnata aceneteeta tnateeeace caatngnatt ceccaenenn
                                                                       720
achattggat necesantte canasangge endeceegg tgnanneene ettityttee
                                                                       780
cttnantgam ggttattene eccingenti ateance
                                                                       817
      <210> 8
      <2115 799
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...{799}
      <223> D = A,T,C OF G
      <400> 8
catitecogg titactitet aaggaaagee gageygaage tgetaaegig ggaateegig
                                                                        60
cataaggaga actitcigci ggcacgrgct agggacaagc gggagagrga cirrqagrgt
                                                                       120
ctgaagegra pgtcccagaa ggtggacttg gcactgaaac agctgggaca catccgegag
                                                                       180
tacgaacago gootgaaagt gotggagogg gaggtocago agtgtagoog ogtootgggg
                                                                       24 D
tgggtggcog angeotgane egetetgeet tgetgeeece angtgggeeg ceaeceeetg
                                                                       300
acctgcctgg gtccaaacac tgagccctgc tggcggactt caagganaac ccccacangg
                                                                       360
ggattttget estanantaa ggstsatetg ggsetegges escesacetg gttggeettg
                                                                       420
tetttgangt gageeceatg tecatetggg ceaetgteng gaeeacettt ngggagtgtt
                                                                       480
ctccttacaa ccacannatg cccqqctcct cccqqaaacc antoccancc tqnqaaqqat
                                                                       540
raagnootgn atcoactunt notanaacog goonconcog engtggaaco encettntgt
                                                                       600
tortttent thagggttaa toregeettg geettneean ngteetnene ntttteennt
                                                                       660
```

```
720
gttnaaattg ttangeneee neennteeen ennemenan eeegaeeena anottanaon
                                                                       780
neetggggt neemengat tgacconnec necetatant tgentinggg nachntgece
                                                                       799
ctttccctct nggganncg
      <210> 9
      <211> 801
      <212> DNA
      <213> Romo sapien
      <22D>
      <221> misc_feature
      <222> (1)...(801)
      <223> n = A, T, C or G
      <400> 9
                                                                        60
acgeettgat ecteccagge tgggactggt tetgggagga geegggeatg etgtggtttg
taangatgac actoocaaaag otgotootga caotgocooa gatggacato gggotcacot
                                                                       120
caeggeceag groecceggt gogggggoog aegoccacet getoottact ctatgagoea
                                                                       180
aatocootgi gggggottot ootigaagto ogcoancagg gotcagioti iggacobang
                                                                       240
caggicatgg ggttgtngne caactggggg ceneaacgea aaanggenea gggeetengn
                                                                       300
carcoateer angargeger taractorty garcterene toraccactt trategreety
                                                                       360
ttentaccey egnatnigie ecancigiti engigeenae tecancitei nggaegigeg
                                                                       420
ctacatacgo coggantono notocogott tgtocotato caoginecan caacaaatti
                                                                       480
encentants cacchattee cachttine agnitteene nnegngette ctintaaaas
                                                                       540
ggttgancce eggaaaatne eecaaagggg gggggccngg tacccaactn ccccctnata
                                                                       600
getgaantee eeatnaeenn gnotenatgg ancenteent titaannaen tietnaactt
                                                                       66D
                                                                       72D
gggaanance ctegneenth ceccenttaa teceneettg enangment ceccenntee
                                                                       780
necemptny gentathana enamanagge econhancam tetestahen estembles
                                                                       BOL
ccancecteg assteggeen e
      <210> 10
      <211> 789
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1) ... (789)
      <223> n = A,T,C pr G
      <400> 10
cagtotatnt ggocagtitt goagotttoc otitiggotic oggiticoaca tigoctittoco
                                                                        60
                                                                       120
acagtytytyc cytyytyaca yottoagoog cootcacegy yttcacctto toagcootyc
agatectgee etacacactg gentennict accannggga gaageaggig itentiques
                                                                       180
aataccgagg ggacactgga ggtgctagca gtgaggacag cctgatgacc agcttcctgc
                                                                       24 D
caggecetaa geetggaget ceetteeeta atggacaegt gggtgetgga ggcagtggee
                                                                       300
tgeteceace tecaceogeg etetgogggg cetetgeetg tgatgtetee gtacgtgtgg
                                                                       360
tgştgggtga geecacogan gecagggtgg ttccgggcec gggcatctge ctggacctcg
                                                                       420
                                                                       480
oratrotoga tagtoctice toototroca nytogreesa toototta toogetreat
                                                                       540
tgtocagetc agcoagtetg teactgoota tatggtgtot googcaggeo tgggtotggt
cocatttact ttgctacaca ggtantattt gacaagaacg anttggccaa atactcagcg
                                                                       600
ttaaaaaatt ccagcaacat tgggggtgga aggcctgcct caetgggtcc aaetccccgc
                                                                       660
                                                                       720
teetgttaae eccatgggge tgeoggettg geogeeaatt tetgttgetg ecaaantnat
gtggetetet getgeeacet gttgetgget gaagtgenta engeneanet nggggggtng
                                                                       7B0
                                                                       7B9
ggngtt¢¢¢
      <210> 11
```

<211> 772

```
<212> DNA
       <213> Homo sapien
       <221> migg_feature
       <222> (1)...(772)
       \langle 223 \rangle n = A,T,C or G
       <400> 11
 recarectar ecassiatia garaceasca cagasaaget ageaatggat teoritetac
                                                                         60
tttgttaaat aaataagtta aatatttaaa tgcctgtgtc tctgtgatgg caacagaagg
                                                                         120
accaacaqge cacateetga taaaaggtaa gaggggggtg gateageaaa aagacagtge
                                                                       : 180
tgtgggctga ggggacctgg ttcttgtgtg ttgcccctca ggactcttcc cctacaaata
                                                                         240
actiticatat giticaaatdo caiggaggag igittecatoo tagaaactoo caigcaagag
                                                                        300
ctacattasa cgaegotgos ggttaagggg ottanagatg ggsaaccagg tgsctgagtt
                                                                        36D
tattcagete ccaasaacee ttetetaggt gtgteteaac taggaggeta getgttaace
                                                                        420
ctgageetgg gtaatecace tgcagagtee cogcatteea gtgcatggaa ccettetgge
                                                                        48D
ctccctgtat aagtccagae tgaaacceee ttggaaggne tocagteagg cageeetana
                                                                        540
aactggggaa aaaagaaaag gacgccccan cccccagctg tgcanctacg cacctcaaca
                                                                        600
gracagggtg gragrassa aaccarttta ctttggraca aacaaaact nggggggra
                                                                        660
acceoggeae ecenangggg gttaacagga ancngggnaa entggaacce aattnaggca
                                                                        720
990ccnccac cccnaatntt gotgggaaat ttttcctccc ctaaattntt to
                                                                        772
      <210> 12
      <211> 751
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc feature
      <222> (1) ... (751)
      <223> n = A, T, C or G
      <400> 12
generalite cagetyceae accaeceacy stylefycat tagttoggat steatacaaa
                                                                         бD
agolgatiga agokkodote tacittitigg tegigagent titigettigi geaggittina
                                                                        120
ttggctgtgt tggtgacgtt gtcattgcsa cagsatgggg gaasggcsct gttctctttg
                                                                        180
asgranggig agreetcass atcogratag tiggigaage cacageacti gagecettic
                                                                        240
atgytgytyt tecacaetty agtgaagtet teetgggaae cataatettt ettgatggea
                                                                        300
ggeactacea geaacgteag ggaagtgete agecattgig gigtacacea aggegaceae
                                                                        360
agcagetgen accteageaa tgaagatgan gaggangatg aagaagaacg tenegaggge
                                                                        420
acacttgete teagtettan caccatanca gecentgaaa accaananca aagaccaena
                                                                        480
encoggetge gatgaagaaa tnaceeeneg ttgacaaact tgcatggcac tggganeeac
                                                                        540
agtggcccna aaaatettca aaaaggatge cocatenatt gaccccccaa atgcccactg
                                                                        600
ccaacagggg ctgccccaca cachaacga tganccaatt gnacaagatc tacatggtct
                                                                        660
that madent gasceetgen tugtggetee tgttesggne ennggeetga ettetnaann
                                                                        720
aangaacton gaagnoocca enggananno g
                                                                        751
      <210> 13
      <211> 729
      <212> DNA
      <213> Homo gapien
      <220>
      <221> misc feature
      <222> (1)...(729)
     <223> n = A, T, C or G
```

```
<40D> 13
gagocaggog tecetetgee tgeecaetea gtggcaacae cegggagetg ttttgteett
                                                                         60
tgtggancet cagcagence efettecaga acteantgee aaganeeetg aacaggagee
                                                                        120
accatgragt getteagett cattaagace atgatgatee tetteraattt geteatettt
                                                                        180
ctytgtggtg cagecetgtt gycagtgggc atctgggtgt caatcgatgg ggcatccttt
                                                                        24D
otgaagatot tegggeeact gtegteeagt geestgeagt ttgteaacgt gggetactte
                                                                        30D
cteatogoag coggogttgt ggtettaget ctaggtttee tgggetgeta tggtgetaag
                                                                        36 D
actgagagea agtgtgeeet egtgaegtte ttetteatee teeteeteat etteattget
                                                                        420
gaggitgeam tectgigte geetiggigt acaccacaat ageigageae ticcigaegi
                                                                        480
tgctggtaat gcctgccatc aanaaaagat tatgggttcc caggaanact tcactcaagt
                                                                        540
gttggaacac caccatgaaa gggctcaagt gctgtggctt cnnccaacta tacggatttt
                                                                       600
gaaganteac ctactteaaa gaaaanagtg cettteecce atttetgttg caattgacaa
                                                                       660
acgtccccaa cacagccaat tgaaaacctg сасссаессе жажиўдэтсе ссаассалаж
                                                                        720
                                                                        729
attnaaggg
      <210> 14
      <211> 816
      <212> DNA
      <213 > Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (816)
      <223> n = A,T,C or G
      c4005 14
tgetetteet caaagtigti etigtigeea taacaaceae ealaggiaaa gegggegeag
                                                                        6D
tyttegetga aggggttgta gtaceagege gggatgetet cettgeagag teetgtgtet
                                                                       12D
                                                                       160
ggraggteca rgragtgerr Ettgtesettg gggasattggs tgrgetggsg rtegtesasg
                                                                       240
ccactcgtgt attiticaca ggcagcctcg tccgacgcgt cggggcagit gggggtgtct
teacaeteca ggaaaetgte natgeageag ceattgetge ageggaaetg ggtgggetga
                                                                       300
                                                                       360
cangtificas apeacactif atgosfectt tecatinnan piffecting iffeastiff
tgancccean anctgcctct casangcccc accttgcaca ccccgacagg ctagastgga
                                                                       420
atottottoc ogaamggtag tinttotigt igoocaance ancocentam acaaactoti
                                                                       480
geanatetge teegnggggg tentantace anogtgggaa aagaaceeca ggengegaac
                                                                       540
caanctigtt tggatnegaa genataatet netntteige tiggiggaea geaccanina
                                                                       600
                                                                       660
ctginnanct tragnochity greetening gritginetity ascetaaten connicaact
                                                                       720
gggacaaggt aantngcont cetttnaatt econanentn ecceetggtt tggggttttn
                                                                       780
cnonctecta occeagaaan neegtgotee eececaacta ggggeenaaa eenntuntte
cacaacccin ccccacccac gggttengnt ggttng
                                                                       916
      <210> 15
      <211> 783
      <212> DNA
      <213> Homo gapien
      <220>
      <221> misc_feature
      <222> (1) ... [783]
      <223> n = A,T,C or G
      <400> 15
ecaaggcetg ggcaggcata nacttgaagg tacaacceca ggaaccectg gtgetgaagg
                                                                        60
                                                                       120
atgtggaaaa cacagattgg cgcctactgc ggggtgacac ggatgtcagg gtagagagga
                                                                       180
aagacccaaa ccaggtggaa ctgtggggac tcaaggaang cacctacctg ttccagctga
                                                                       240
cagtgactag ctcagaccac ccagaggaca cggccaacgt cacagtcact gtgctgtcca
ccaagcagae agaagactae tgeetegeat ccaacaangt gggtegetge eggggetett
                                                                       300
                                                                       36 D
```

toccaegetg gtactatgae cocaeggage agatetgema gagtttegtt tatggagget

```
gettyggesa casgascase tacetteggg sagasgagtg cattetance tytengggtg
                                                                        420
 tgcaaggtgg gcctttgana ngcanctetg gggcteange gactttecce cagggccoct
                                                                        480
 ceatggaaag gegecatees nigtieteig geaceigtea geccaeerag tiregetees
                                                                        54D
nesstagate atgestense suttleating satisficates acadecocca interceocsa
                                                                        600
ecctecease asagetteec tgttmasasa taunecantt ggettttmac aaacneegg
                                                                        660
enceteentt tteecenntn aacaaaggge netngenttt gaactgeeen aaccenggaa
                                                                        720
tetneenings assauntnee ecceetight cethnaance ceteenenaa ancticeecce
                                                                        780
                                                                        783
       <210> 16
       <211> 801
       <212> DNA
      <213> Homo sapien
      <220≻
      <221> misc_feature
      <222> (1)...(801)
      <223> n = A,T,C or G
      <400> 16
gecocaatte cagetgecae accaeccaeg gtgaetgeat tagtteggat gteatacaaa
                                                                        60
agolgatiga agoaaccolo tachittigg togigagect thigetiggi goaggittea
                                                                        120
ttggctgtgt tggtgaogtt gtcattgcaa cagaatgggg gaaaggcact gttctctttg
                                                                        160
aagtagggtg agtootoaaa atoogtatag ttggtgaago cacagcactt gagooottto
                                                                        240
atspiggigt tecacacity agigaasiet teetssgaac cataateitt ettsatssca
                                                                        300
ggeactacca geaacgteag gaagtgetea geeattgtgg tgtacaccaa ggegaccaca
                                                                        360
gcagctgcaa cotcagcaat gaagatgagg aggaggatga agaagaacgt cncgagggca
                                                                        420
caettgetet cegtettage accatageag cecangaaac caagageaaa gaecacaaeg
                                                                        480
congetgega atgassgsss ntsceesegt tgscsaactg catggccact ggacgacsgt
                                                                        540 .
Eggccogaan atcttcagaa aagggatgec ccatcgattg aacacccana tgcccactgc
                                                                       600
cnacapport geneenenen gaaagaatga geeattgaag aaggatente ntggtettaa
                                                                       660
tgaactgaaa contgoatgg tggcccctgt tcagggctct tggcagtgaa ttctganaaa
                                                                       720
aaggaachge nthageecee ecaaangana aaacaceeee gggtgttgee etgaattgge
                                                                       780
gyccaaggan coctgoocen g
                                                                       801
      <210> 17
      <211> 740
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(740)
      <223> n = A,T,C or G
gigagageca ggogiecete igeetgeeca eteagiggea acaecoggga geigtitigi
                                                                        бO
cetitstsga secteaseas theestolit casaacteas tsccaasage cotsaacags
                                                                       120
agecaceaty cagtgettea getteattaa gaccatgaty atcetettea atttgeteat
                                                                       160
ctttctstgt sotgcagece tgttggcagt gggcatetgs gtgtcaatcg atggggcate
                                                                       240
etttetgaag atetteggge cactgtegte cagtgecatg cagtttgtea acgtgggeta
                                                                       300
ettectcate geageeggeg ttgtggtett tgetettggt tteetggget getatggtge
                                                                       360
taagacggag agcaagtgtg coctogtgac gttcttcttc atcctcctcc tcatcttcat
                                                                       42D
tgctgaagtt gcagctgctg tggtcgcctt ggtgtacacc acaatggctg aaccattect
                                                                       48D
gacyttycty grantyccty ccateaanaa agattatyyy ttoccayyaa aaattcacte
                                                                       540
aantnigsaa caccnceatg aaaagggete eaatttetgn tggetteeee aactataeeg
                                                                       600
gasttttgaa agantchece tactteesaa aasaasanant tgeetttnee econttetgt
                                                                       660
tycaatyaaa acntcccaan acngccaatn aaaacctycc cnnncaaaaa gyntoncaaa
                                                                       720
```

cassassant nnesgogttn

740

```
<210> 18
       <211> 802
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (802)
      <223> n = A, T, C \text{ or } G
      <400> 18
cescingting energyteen granageene grangeregie agentacies geetenaten
                                                                          60
Caaggtette cagetgeege acattacgea gggeaagage ctccageaae actgeatatg
                                                                         120
ggatacactt tactitagca gccagggtga caactgagag gtgtcgaagc ttattottot
                                                                         180
gagoctotgt tagtggagga agattroggg ottragetma gtagtcageg tatgtorrat
                                                                         240
aagcaaacac tgtgagcagc cggaaggtag aggcaaagtc actotcagcc agctotctaa
                                                                         300
cattigigicat giccagicagit totoccaacoa ogtagacaco agniggicotoc agcacotigat
                                                                         360
ggatgagtgt ggccagcgct gcccccttgg ccgacttggc taggagcaga aattgctcct
                                                                         420
ggttotgeco tgtcacotto acttoogoac toatcactgo actgagtgtg ggggacttgg
                                                                         480
geteaggatg tecagagaeg tggtteegee cectenetta atgacacegn ceanneaace
                                                                         540
gteggetese geegantgng ttegtegtne etgggteagg gtetgetgge enetaettge
                                                                         600
sancticgic nggeccatgg sattracene aceggasein giangatees cinnitetat
                                                                         660
aaceggnege cacegennnt ggaactecae tetintinee titaetigag ggitaaggie
                                                                         720
accettning thacettggt ecaaacentii centgtgteg anatiigtiiaa tenggiicena
                                                                         780
tnççançene atangaagee ng
                                                                         802
      <210× 19
      <211> 731.
      <212> DWA
      <213> Homo sapien
      c220>
      <221> misc_feature
      <222> (1) ... (731)
      <223> n = A,T,C or G
      <4QD> 19
enaagettee aggtnaeggg cegenaance tgaceenagg tancanaang cagnengegg
                                                                         60
gageccaeeg teaegngang gngtetttat nggaggagge ggagecaeat enetggaent
                                                                        120
cntgacccca acteccence neneantgea gtgatgagtg cagaactgaa ggtnacgtgg
                                                                        180
caggaaceaa gancaaanne tgeteennte caagteggen nagggggegg ggetggeeae
                                                                        24 D
geneateent enagtgetgn aaageeeenn eetgtetaet tgtttggaga aengennnga
                                                                        300
                                                                        360
catgoccagn gttanataac nggcngagag tnantttgcc totccottcc ggctgcgcan
cgngtniget lagnggaest saccigaeta cilascigas cocongasic inconcecti
                                                                        420
ccactaaget cagaacaaaa aacttegaea ccactcantt gtcacctgnc tgctcaagta
                                                                        480
aagtgtacco cathoocaat gintgoinga ngctoignee igenitangi teggiceigg
                                                                        540
gaagacetat caattmaage tatgitteig actgeetett geteeeigna acaanemace
                                                                        6DO
                                                                        650
ennennteea agggggggne ggccccaat ccccccaacc ntnaattnan tttanccccn
                                                                        720
ceccengged eggeetttta enamentenn nnacngggna aaacennnge ettneceaac
nnaateenee t
                                                                        731
      <210> 20
      <211> 754
      <212> DNA
      <213> Homo sapies
```

DESCRIPTION AND ASSESSMENTS .

```
<220>
       <221> misc_feature
       <222> (1),..(754)
       <223> n = A,T,C or G
       <400> 20
ttttttttt ttttttt taaasseere eterstmaa tynssatte egassttyte
                                                                        60
caseccete ntecasatin contituegg gngggggtte casaccess teannittgg
                                                                       120
annttaeatt meathtinnt tggnggnnna ancchaatgt mengaaagtt meacccante
                                                                       180
thanctthaw theotogram congright comments thancetta antecetery
                                                                       240
asatngttna nggaasacce aanttetent aaggttgttt gaaggntnaa tnasaancee
                                                                       300
nnoceatigt tittingcoac gootgaatta attggntice gnigititee nitaeaanaa
                                                                      360
gganancer ggttantas tececcone eccastas coganitati tingastigg
                                                                       420
gancemegg gasttsaegg ggnnnntess tottgggggg enggnness essenteggg
                                                                       48 D
gyttnyggnc aggnennaat tytttaaggg teegaaaaat eeeteenaga aaaaaanete
                                                                       540
ccasgintgas notinggittt necececee cangidecet etegnanagt tggggtttgg
                                                                       600
ggggcctggg atttinttte cectnitimes tesesesses sengggamag aggtingngt
                                                                       660
tttgntcnnc ggccccncen aaganetttn ccganttnan ttaaatecnt gcctnggcga
                                                                       720
agteentign agggntaaan ggeeceeinn eggg
                                                                       754
      <210> 21
      <211> 755
      <212> DNA
      <213> Homo sapien:
      <220>
      <221> misc_feature
      <222> (1)...(755)
      <223> n = A,T,C \text{ or } G
      <400> 21
atcancecat gaeceenaac ungggaeene teanceggne nunenacene eggeenatea
                                                                        50
ningthagino actionnitin nateacheed enconactad geochemane chacgeneta
                                                                       120
nncanatnee actganngeg egangtngan ngagaaanet nataceanag ncaccanaen
                                                                       180
ccapetated nameanged unnatedag unnatedast utguarded chaquattu
                                                                       240
nnenneanat gattitectn ancegatiae centrocece tancecetce eccedaacna
                                                                       300
cgaaggenet geneemaagg ingegnence cegetagnic ecenneaagt enenemeeta
                                                                       360
aacteaneen nattaenege ttentgagta teacteceeg aateteacee tacteacee
                                                                       420
asakanaten gatacassat satnesagee tenttatnae actntgsett getetetatt
                                                                       480
ttagnggtec ninaanente etaataette cagteineet tenecaatti eenaangget
                                                                       540
ctttengaca geathttttg gttecenntt gggttettan ngaattgeee ttentngaae
                                                                       60D
gggetentet titeettegg tianeetggm tienneegge eagttattat tieeentitt
                                                                       660
aasttentne entitantit togentiena aaeeecegge ettgaaaaeg geeceetggt
                                                                       720
aaaaggtigt trigansaaa trittgtitt gitco
                                                                       755
      <210> 22
      <211> 849
      <212> DNA
      <213> Homo şapien
      <220>
      <221> misc feature
      <222> {1}...(849}
      <223> n = A,T,C or G
      <400> 22
Etttttttt titttangig inglogigea gglagsggct tactscaani gigaanacgi
                                                                       6 D
acgetnggan taangegace eganttetag gannenceet aaaatcanae tgtgaagatn
                                                                      120
```

```
atectgonna eggaanggte aceggnogat notgetaggg tgocenetee cannoentto
                                                                       180
cataacteng nggccctgcc caccaccttc ggcggcccng ngnccgggcc cgggtcattn
                                                                       240
gnntteacen cactungens neggttteen necconneng acconggega teoggggtne
                                                                       3 D D
totgtotter optgmagnen anaaantggg concggmeet etttacceet mnackageea
                                                                       36D
engeenteta neenengeee eccetecant nngggggact geenannget cegitnetng
                                                                       420
nnaccconnn gggtneeteg gttgtegant enaccgnang ccanggatte enaaggaagg
                                                                       480
tgcgttnttg gcccctacce ttcgctncgg nncacccttc ccgacnanga nccgctcccg
                                                                       540
                                                                       600
chenneghing extendeteg caacaccege netentengt neggninese ecceaccoge
                                                                       660
necetenene ngnegnanen eteeneenee gteteannea eeaeceegee eegecaggee
                                                                       720
nteanceach ggmngachng nagenemnte geneegegen gegmeneest egeenengaa
ctnentengg coantinger teaancenna enamadeeg etgegegee cynagegnee
                                                                       780
necteonega gtoctedegn ettednaded anguntteen egaggadaen unadddegee
                                                                       840
                                                                       849
nncangegg
      <210> 23
      <211> 872
      <212> DNA
      <213> Homo sapien
      <220>
      <2215 misc_feature
      <222> (1)...(872)
      \langle 223 \rangle n = A,T,C or G
      c400> 23
gegeasacta tacttegete gnactegtge geetegetne tetttteete egeaaceatg
                                                                        6 D
tetgachane cegattigge ngatatenan aagntegane agteeaaact gantaacaca
                                                                       120
cacacnonan aganametee notsecttee anagtanaen attgaacnng agaaccange
                                                                       180
nggegaateg taatnaggeg tgegeegeea athtgtence gtttatthin ecagentene
                                                                       240
ctnccnacce tachtetten nagetytenn acceptnyth cynacecec nagytegga
                                                                       300
toggettton untgacegng concecetes secunteest nacquisens cogcassacs
                                                                       360
namngenege needegnnet ettegeened etgteetnin eddetginge etggenengn
                                                                       420
                                                                       480
acceptation ecctoscent ctnenngaaa negnanacet coggettenn annancecte
taggninges tetscheese attectteen nemnettees ecstettent tacaggetet
                                                                       540
configente tennesche entgigaege intrethige recentinae tencecett
                                                                       600
cgncgtgncc cgnccccacc ntcatttnca nacgntottc acaannnoct ggntnnotcc
                                                                       650
chancegnen greaternag ggaagggngg ggmreemitg mitgaegtig nggngangte
                                                                       720
egaanantee tencentean enetweeet egggeganet etengtinee aactiancaa
                                                                       780
nteteccor ngagemente teagestene concesent etetgeants thetetgets
                                                                       840
                                                                       872
tnacenntac gantnttegn enecetett ce
      <210> 24
      <211> 815
      <212 > DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(815)
      <223> n = A, T, C or G
      <400> 24
gcatgcaage ttgagtatte tatagngtea cetaaatane ttggentaat catggtenta
                                                                        60
nctgnettee tgtgteaaat gtataenaan tanatatgaa tetnatntga caaganngta
                                                                       120
tentneatta gtaacaanto tentgteest cetgtengan canatteess thnattnegn
                                                                       180
cycattenen geneantatn taatnyyyaa ntemnntmmn mescennest etatemtnee
                                                                       24 D
                                                                       30D
genecetgae tggmagagat ggatmantte tmmtmtgace macatgttea tettggattm
aananeeece egengneeae eggttngnng enageennte eeaagaeete etgtggaggt
                                                                       360
```

```
aacetgegte aganneates aacntgggaa aeeegennee angtnnasgt ngnnneanan
                                                                        420
 gatecegtee aggnttnace atceettene agegeeeset tingigestt anagngnage
                                                                        48D
 gtgtccmanc chetcaacat ganacgegee agneeanceg caattnggea caatgtegne
                                                                        540
 gaacececta gggggantna theadancee caggattgte enencangaa atccencane
                                                                        600
 econcectae connettigg garngtgare aantecegga ginecagies ggeengnete
                                                                        66 D
 ecceaceggt naccategggg gggtgaanet engnateane engnegagga ntegnaagga
                                                                        720
 accegenceto egnogaanng ancontonga agngoonont ogtataacco cocctonoca
                                                                        780
 nccnacognt agnicoccec engggtnogg sangg
                                                                        815
       <210> 25
       <211> 775
       <212> DNA
       <213> Homo Bapien
       <220×
       <221 > misc_feature
       <222> (1)...(775)
       <223> n = A,T,C or G
       <400> 25
 cognatate togetecata goettageta tactogoget actotetet totageotage
                                                                         60
 aggetateca gegtaeteca aagatteagg titaeteaeg teatecagea gagaatggaa
                                                                        120
agtomaattt cotgamtigo tatgtgtotig ggtttcatoo atcogmontt gammigact
                                                                        180
 tactgaagaa tgganagaga attgaaaaag tggagcattc agacttgtot ttcagcaagg
                                                                        24 D
 actggtcttt ctatctcntg tactacactg aattcacccc cactgaaaaa gatgagtatg
                                                                        30D
cotgoogtgt gaaccatgtg acttogtcac agoccaagat agttaagtgg gatcgagaca
                                                                       360
tytaaycayn concatyyaa ytttyaayat geegeattty gattyyatga atteeasatt
                                                                       420
ctgcttgctt gcnttttaat antgatatgc ntatacaccc taccctttat gnccccaaat
                                                                       480
tgtaggggtt acatmantgt tementngga catgatette etttataant cencentteg
                                                                       540
aattgooogt encomngtto ngaatgitte ennasceaeg gitggeteee ceaggience
                                                                       600
tettacggaa gggeetggge enettineaa ggttggggga accnaaaatt tenetinige
                                                                       560
conceences enniettging increantit ggaaceette enatteeeet tggeetenna
                                                                       720
ncettnneta anassaettn saaneginge nasannittn setteegee Etsee
                                                                       775
      <210> 26
      <211> 820
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1),,(820)
      <223> n = A,T,C'or G
      <400> 26
anattantac agtgtaatct tttcccagag gtgtgtanag ggaacggggc ctagaggcat
                                                                        60
ordanagate nottatanca acagigotit garcaagago igrigggead allicolgea
                                                                       120
panaaggtgg cggtccccat cactcctcct ctcccatage catcccagag gggtgagtag
                                                                       180
cesteangee tteggtggga gggagteang gaaacaacan accacagage anacagacca
                                                                       240
ntgatgacca tgggcgggag ogagcetett ceetgnaccg gggtggcana nganagceta
                                                                       300
netgaggggt cacactataa aegttaacga cenagatnan cacctgette aagtgeacce
                                                                       360
tteetacetg acnaecagng accmnaact gengeetggg gaeagenetg ggancageta
                                                                       420
achnageact cacetocccc cccatogccg thogenteec togtectone asoggaaget
                                                                       4 B O
cortattaga attnegggga naccaaggga noreceteet ecanetgtga aggaasaann
                                                                       540
gatggasttt inceetteeg geennieses telleettia eacgeesst intactents
                                                                       60D
tecetetott oteetgoene aettttoace commattte eettnattga teggannetn
                                                                       660
ganattecae tonogectne entenateng naanacnaaa nactntetna econgggat
                                                                       720
gggnncctog ntcatectet ctititenet accreenntt ctitgeetet cettrgatea
                                                                       78D
```

```
620
tecascente gniggeenin ecceccenna tectitacce
      <210> 27
      <211> 818
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(818)
      <223> n = A,T,C \Leftrightarrowr G
      <400> 27
tetgggtgat ggcetettee teeteaggga cetetgaetg etetgggeea aagaatetet
                                                                        бQ
tottetet eegageeeca ggeagegotg atteageest geceaacetg attetgatga
                                                                       120
ctdcddetdc fdfacedac ccspdddce seredddrcc cedddrcced ddedddcdc
                                                                       1BD
ctgrtgagea cttccgcccc teaccetgee cagecectge catgagetet gggetgggte
                                                                       240
tecgecteca gggttetget ettecangea ngecancaag tggegetggg ceacactgge
                                                                       300
ttetteetge coentecetg getetgante tetgtettee tgteetgtge angemeettg
                                                                       360
gateteagtt tecetemete anngaactet gtttetgann tetteantta actntgantt
                                                                       420
tatnaccnan togenetytne tytennactt taatgggeen gacoggetaa teceteeste
                                                                       480
netereties antiennema acongeties ententetes centaneces congagaans
                                                                       540
                                                                       600
etcetttgee etnaceangg geennnaceg ecentnactn ggggggenng gtanetnene
etantinece enetenent treatestee ennennegen roseanntte rengteeenn
                                                                       660
                                                                       72D
thretetten ngthtegnaa nghtenenth thrannnghen nghtnothen tecetetene
connitgiang inntinness sengenceec monneamous aggmentane tetresenge
                                                                       CBT
                                                                       818
cconnecece ngnattaagg ceteenniet ceggeene
      <210> 28
      <211> 731
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(731}
      <223> n = A,T,C or G
      <400> 28
aggaagggcg gagggatatt gtangggatt gagggatagg agnataangg gggaggtgtg
                                                                        60
tecesacatg angotgongt tetettttga angagggttg ngtttttann cenggtgggt
                                                                       120
gattmaxcoc cattgtatgs agnnaaaggn tttnagggat ttttcggctc ttatcagtat
                                                                       180
ntanatteet ginaategga aasinainti tennenggaa aaintigete eesteegnaa
                                                                       24 D
attnotcocg ggtagtgcat nttngggggn cngccangtt toccaggotg ctanaatcgt
                                                                       300
actaaagntt naagtgggan tucaaatgaa aacetnucae agagnateen taccogaetg
                                                                       360
tnanttacct tegecetatg actetgenng ageceaatac ccongagnat gtcacconga
                                                                       420
nnngcgnede tgaaannnne tegnggetnn ganeateang gggtttegea teasaagenn
                                                                       480
egittenest maaggeactt ingesteate caacensing costemness ittingesite
                                                                       540
                                                                       €00
nggtteneet aegetnning enceinnin ganattitine eegeeinggg naaneeteet
gnaatgggta gggnettnic tittnaeenn gnggintaet aatenmeine aegeninett
                                                                       660
                                                                       720
tetenacece ceceetttt caateceane genaatggg gteteceenn eganggggg
                                                                       731
nnneccanne e
      <210> 29
      c211> 822
      <212> DNA
      <213> Homo sapien
```

```
<220>
       <221> misc_feature
       <222> (1)...(822)
       <223> n = A,T,C or G
       <4D0> 29
 actagtecag tgtggtggaa ttccattgtg ttggggncnc ttctatgant antnttagat
                                                                         БĠ
 egeteanace teacaneete consenange etataangaa hannaataga netginenni
                                                                        120
 athintache teatannect chinacceae tecetettaa ecentaetst gestatngen
                                                                        180
 thnetantet ntgeegeeth chanceacon gtgggeenac encungnatt etenatetee
                                                                        240
 tenecatnin gertamanta ngineatace etatacetae necaatgeta nonetaanen
                                                                        300
 tecatnantt annntaacta coactgacht ngactttene atmanetect aatttgaate
                                                                       <sup>2</sup> 360
 tactotgact cocaengect annuattage anenteccee nacuatutet caaccaaate
                                                                        420
ntcaaceace tatetanety ttencoasee attacetecy etecconae asecceete
                                                                        480
ccaaatacco necetgae nectaaccon caccateceg geaageenan ggneatttan
                                                                        54D
ccactggaat cachaingga naaasaaaac conaactoto tanchonnat ctccctaana
                                                                        600
aatneteetn naatttaetn neantnecat caaneceach tgaaachnaa eccetgtttt
                                                                        660
tanatecett etttegaaaa eenaceettt annuceeaae ettinggged eecceneine
                                                                        720
consatgang gnenecesat changaance ncentgassa anchaggens anannateeg
                                                                        780
canatoctat coettantin ggggnccett necenggges es
                                                                        822
      <210> 30
      <211> 787
      <212> DNA
      <213> Komo sapien
      <220>
      <221> misc_feature
      <222> (1), (7B7)
      \langle 223 \rangle n = A,T,C or G
      <400> 30
eggeegeetg etetggeaca tgeeteetga atggeateaa aagtgatgga etgeecattg
                                                                        6 D
ctagagaaga cettetete tactgteatt atggageest geagactgag ggeteeest
                                                                       320
gtotgoagga tttgatgtot gaagtogtgg agtgtggott ggagotooto atotacatna
                                                                       180
gerggaagee etggagggee tetergeea geetgeeget teterang etetesangg
                                                                       240
acaccagggg ctccaggcag cocattattc ccagnangac atggtgtttc tccacgcgga
                                                                       300
cccatggggc ctgnaaggcc agggtetect ttgacaccat ctctcccgtc ctgcctggca
                                                                       360
specytygga tecaetantt etanaacygn cyccacency gtyggagete cagetttigt
                                                                       420
tecentiaat gaagettaat tgenegetto gegtaateat negteanaae tnitteetot
                                                                       480
gigasatigi tinicoccio nonsticono nonacataon saccoggsan catsaagigi
                                                                       540
taaageetgg gggtngeetn nngaatnaae tnaacteaat taattgogtt ggeteatgge
                                                                       600
cegettteen ttenggaaaa etgtenteee etgenttnnt gaateggeea eeceeenggg
                                                                       660
aaaageggtt tgenttting ggggnteett conciteece cetenetaan ceetnegeet
                                                                       720
eggtegttne nggingeggg gaangggnet nnnetecene neagggggng egnnngniat
                                                                       780
ccccaaa
                                                                       787
      <210> 31
      <211> 799
      <212> DNA
      <213> Homo Bapien
     <220>
     <221> misc feature
     <222> (1)...(799)
     <223> n = A,T,C or G
     <4D0> 31
```

```
ttttttttt ttttttggc gatgotactg tttaattgca ggaggtgggg gtgtgtgtac
                                                                       60
catgtaccag agetattaga ageaagaagg aaggagggag ggeagagege cetgetgage
                                                                      750
aacaaaggac teetgeagee ttetetgtet gtetettgge geaggeacat ggggaggeet
                                                                      180
coopcagggt gggggccacc agtecagggg tegggagcact acanggggte egagtgegte
                                                                      240
gtggotggtm cmaatggcct gmcacamate cetacgatte tigacacetg gatticacea
                                                                      300
ogggacette tgttctccca nggnaactte ninnateten aaagaacaca actstttett
                                                                      360
engeanttet ggetgtteat ggaaageaca ggtgteenat tinggetggg acttggtaca
                                                                      420
tatggttcog geocacetet countenaan aagtaattea coccececa centetnitig
                                                                      460
cotgggccct taantaccca caccggaact canttantta tteatettng gotgggcttg
                                                                      540
ntnatcnoca cotgaangeg coaagttgaa aggccacgee gtncccncte eccatagnan
                                                                      600
nttttnnent canctaatge ceeceengge aacnateeaa teeceeceen tgggggecee
                                                                      660
agreeangge recegneteg ggmnneengn enegmantee etaggmtete teantengne
                                                                     720
cennagence ecegeacges gascansagg atagageene egeannana aggtanease
                                                                      780
                                                                      799
ctogeocce connegning
      <210> 32
      <211> 789
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1),,. (789)
      <223> n = A,T,C or G
      <400> 32
bttttttttt
                                                                      60
tittnecnag ggeaggitta tigacaacci enegggacac aancaggeig gggacaggac
                                                                     120
                                                                     1BQ
aboracedac postodeca dossocatos cóchacepte astrocare utacadeste
                                                                     240
egebedeget tgaintiest cigcageige aggaigesni aaaasagggs cioggesnin
                                                                     300
ggtgggcacc ctgggatttn aatttecacg ggcacaatge ggtogcance cctcaccacc
nattaggaat agtggtntta coonconceg ttggcdcact cocchtggaa accacttnte
                                                                     360
                                                                     420
geggeterge catetigetet taascettge assencigge gecelettit iggitanini
ncongecaes atestnacte sgaetggene gggetggece essassanen eccesassee
                                                                     48D
                                                                     540
ggnecatgte tinneggggt tgetgenath theatewest eccgggenea heaggnease
ccasaagtto ttynggccon caaaaaandt ccggggggnc ccagttteaa caaagtcate
                                                                     600
                                                                     660
occoptages cossastest cossessatt netgggttig ggaacesseg cetetnactt
                                                                     720
Eggnnggcaa gntggnteec cettegggee eeeggtggge cennetetaa ngaaaaenee
                                                                     780
ntectnonea ceatececce ongonacque tancaangna tecettette tanaaacqqq
                                                                     789
ecceceneg
      <210× 33
      <211> 793
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(793)
     <223> n = A,T,C or G
     <400> 33
                                                                      6 D
gacagaacat gttggatggt ggagcacctt tctatacgac ttacaggaca gcagatgggg
                                                                     120
asttestage tgttggages stansseece agttetsegs getgetgste sasggaettg
                                                                     180
gartaaagte tgatgaactt occaatcaga tgagcatgga tgattggcca gaaatgaana
                                                                     240
agaagtttgc agatgtattt gcaaagmaga cgaaggcaga gtggtgtcaa atotttgacg
geacagatge efgtgtgaet eeggttetga ettttgagga ggttgtteat catgatcaea
                                                                     300
acaangaacg gggcttgttt atcaccantg aggagcagga cgtgagcccc cgccctgcac
                                                                     360
```

```
ctotgctgtt aaacacccca gccatecctt ctttcaaaag ggatecacta cttctagage
                                                                         420
 ggnegecace geggtggage tecagetttt gtteeettta gtgagggtta attgegeget
                                                                         480
 tggogtaatc atggtcatan ctgtttcctg tgtgaaattg ttatccgctc acaattccac
                                                                         540
 acaacatacg anceggaage atmeaatttt asageetggm ggtmgeetaa tgamtgaagt
                                                                         600
 nacticacett settiggetti gegeteactg coegettice agtooggasa acctgtectt
                                                                         660
 gecagetgee nttaatgaat enggecacce eccggggaaa aggengtttg ettnttgggg
                                                                         720
 egenettees getttetege tteetgaant cetteesees ggtetttegg ettgeggena
                                                                         780
 acggtatena cet
                                                                         793
       <210> 34
       <211> 756
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(756)
       <223> n = A, T, C \text{ or } G
       <400> 34
Bookedaced destatacks dessetessa Adeksateds secotssess coocsatett
                                                                         60
ancaagtgog gggaanagot gggtcgacto aagctagtto thotggagot caacetottg
                                                                        120
ccaaccacag ggaccaaget gaccaaacag cagetaatte tggccogtga catactggag
                                                                        180
atoggggccc aatggagcat cctacgcaan gacatecect ccttcgagog ctacatggcc
                                                                        240
cagotoasat gotactactt tgattacaan gagosgotoe cogagtosgo otatatgoso
                                                                        300
cagetettigg geetesacet cetettecte etetecessa accegegege tentnecae
                                                                        360
acgganttgg aneggetgee tgcccaanga catacanace aatgtetaca tenaccacea
                                                                        420
gtgtcctgga gcaatactga tgganggcag ctaccncaaa gtnttcctgg ccnagggtaa
                                                                        480
catecorege egagagetae acettettea tigacateet getegacaet atcagggatg
                                                                        540
asantegeng ggttgetees gasaggetne asnaanstee ttttenetga aggeeeegg
                                                                        600
atmonotage notagaateg geoegecate geggtggane etecaacett tegttmeeet
                                                                        660
ttactgaggg ttnattgeog eccttggegt tatcatggtc acncengttn ectgtgttga
                                                                        720
satthttasc coccacaat tocacgoons cattng
                                                                        756
      <210> 35
      <211> B34
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc feature
      <222> (1) ... (834)
      \langle 223 \rangle n = A,T,C or G
      <400> 35
ggggatetet anatonacet gnatgeatgg ttgteggtgt ggtegetgte gatgaanatg
                                                                        60
aacaggatet tgecettgaa getetegget getgtnttta agttgeteag tetgeegtea
                                                                       130
tagteagaca enetettggg caaaaaacan caggatntga gtettgattt cacetecaat
                                                                       180
aatottengg getgtetget eggtgaacte gatgaenang ggeagetggt tgtgtntgat
                                                                       240
asantocano angitotoco togigacoto conticasas tigitocogo oticatosa
                                                                       300
ettetnnaan angannance cancettegte gagetggnat tegganaaca egteactget
                                                                       36D
ggsaartgat cccasstggt stgtcatccs tcgcctctgc tgcctgcass saacttgctt
                                                                       42D
ggeneaaate egacteeeen teettgaaag aageenatea caccecete cetggactee
                                                                       480
nneaangaet etneegetne coenteenng cagggttggt ggcanneegg gecentgege
                                                                       540
ttetteagee agiteaenat niteateage ecetetgeea getgithtat teetiggggg
                                                                       600
ggaancogte tetecettee tgaannaact ttgacegtng gaatageege genteneent
                                                                       660
achtnetggg eegggttess anteceteen tignennien eetegggees tietggatti
                                                                       720
ncensactit ticcticcec encocencyg nyttiggnit titcainggg eccesactet
                                                                       780
```

```
834
getottggee anteceetgg gggentntan eneceetht ggteeening ggee
      <210> 36
      <211> 814
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...[814]
      \langle 223 \rangle n = A,T,C or G
      <400> 36
oggnogettt congeegege ceegttteea tgacnaagge teectteang ttaaatacmn
                                                                         ٥D
cotagnazae attaatgggt tgototacta atacatoata enaaccagta agcotgooca
                                                                        120
naacgocaac teaggocatt estaceaaag gaagaaagge tggtetetee accecetgta
                                                                        180
ggaaaggeet geettgtaag acaccacaat neggetgaat etnaagtett gtgbbttaet
                                                                        240
aatggaaaaa aaaaataaac aanaggtttt gtteteatgg etgeecacog eageetggea
                                                                        30D
ctaaaacanc ccagcgctca cttctgcttg ganaaatatt ctttgctctt ttggacatca
                                                                        360
ggottgatgg tatcactgec acntttecac coagetgggo necetteccc catntttgtc
                                                                        420
antganctgg asggcctgaa nottagtoto casaagtoto ngoccacaag acoggccacc
                                                                        480
aggggangte ntttncagtg gatetgeeaa anantaceen tateatennt gaataaaaag
                                                                        540
geocetgaac ganatgette cancancett taagacceat aateetngaa ceatggtgee
                                                                        600
etteeggtet gateenaaag gaatgtteet gggteeeant cocteettig tinettaegt
                                                                        660
                                                                        720
tgtnttggac centgetngn atnacecaan tganateere ngaageacee tneecetgge
attigantit untaaattot otgoodtaon notgaaagoa chattoooth ggundonaan
                                                                        780
                                                                        814
ggngaactca agaaggtetn ngaaaaacca cncn
      <210> 37
      <211> 760
      <212> DNA
      <213> Komo sapien
      <220>
      <221> misc feature
      <222> (1) ... (76D)
      <223> n = A,T,C or G
      <400× 37
gcatgotgot ottootcaaa gttgttottg ttgccataac aaccaccata ggtaaagogg
                                                                        60
gegeagtgtt egetgaaggg gttgtagtae eagegeggga tgeteteett geagagteet
                                                                       120
gtgtetggca ggtecaegea atgecetttg teactgggga aatggatgeg etggageteg
                                                                       18Q
tenaaneese tegtgtattt tieseanges geeteeteeg sagenteegg gesgtiggig
                                                                       240
gtgtcgtcac actccactaa actgtcgatn cancagerea ttgctgcage ggaactgggt
                                                                       3 D 🗗
                                                                       360
gggetgacag gtgccagaac acactggatn ggccttteca tggaagggcc tgggggaaat
                                                                       420
encetnance caaactgoot eteaaaggee acettgoaca eccegacagg ctagaaatgo
                                                                       480
actettette ceaaaggtag ttgttettgt tgeeeaagea neeteeanea aaecaaaane
ttgcaaaato tgctccgtgg gggtcatnnn taccanggtt ggggaaanaa acccggchgn
                                                                       540
ganconcett gtitgaatge naaggnaata atecteetgt ettgettggg tggaanagea
                                                                       600
castigmact gitamentig ggccgngtic eneingggig gictgaaact aatcmccgic
                                                                       66 D
actggazaaa ggtangtgcc ttccttgaat tcccaaantt cccctngntt tgggtnnttt
                                                                       72D
                                                                       76 D
etectotnee etaaaaateg totteeceee centanggeg
      <210> 38
      <211> 724
      <212> DNA
      <213> Homo sapien
```

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```
<220>
       <221> misc feature
       <222> (1) ... (724)
       <223> n = A,T,C or G
 ttttttttt tttttttt tttttttt tttttaaaaa ccccctccat tgaatgaaaa
                                                                         60
 cttccnaaat tgtccaacce cetennecaa atnnecattt cegggggggg gttccaaace
                                                                        120
 caaattaatt ttgganttta aattaaatnt tnattngggg aanaanccaa atgtnaagaa
                                                                        180
 satttaaccc attatnaact tasatnoctn gasaccontg gnttocasas strtttaacc
                                                                        240
 cttaaateee teegaaattg mtaanggaaa accaaatten eetaaggetn titgaaggit
                                                                       300
 ngatttaaac ccccttnant tnttttnacc cnngnotnaa ntatttngnt tooggtgttt
                                                                       360
 tectnttaan eninggiaac teeegniaat gaannneest aanecaatta aacegaatti
                                                                        420
 tttttgaatt ggaaatteen ngggaattna coggggtttt tecentttgg gggccatnee
                                                                        480
 cccnctttcg gggttlgggn ntaggttgaa tttttnnang ncccaaaaaa ncccccaana
                                                                       540
 adabbactee cabgunttaa tingaatnie eeeetteeea ggeettitgg qaaaqqqqq
                                                                       60D
 tttntggggg cengggantt entteeccen ttnccncccc ecceenggt aaangsttat
                                                                       66D
ngnntttggt ttttgggece ettnanggae etteeggatn gaaattaaat eecegggneg
                                                                       720
9009
                                                                       724
       <210> 39
       <211> 751
       <212> DMA
       <213> Homo sapien
      <220x
      c221> misc_feature
      <222> (1)...(751)
      <223> n □ A,T,C or G
      <400> 39
tettettet tettetettg etcacattta atttetattt tgattettt taatgetgea
                                                                        60
Cascadaata tetattedat Etgettettt tattedatet tattegettg etgetgetgt
                                                                       120
tttatttatt tttactgasa gtgagsggs acttttgtgg ccttttttcc tttttctgta
                                                                       180
ggccgcctta agctttctaa atttggaaca tctaagcaag ctgaanggaa aagggggttt
                                                                       24 D
cycaaaatca cheggegeaa nggaaagght getttyttaa teatgeceta tegtgegega
                                                                       300
thascigott gracestiac nittoectit tastiactig igcinsange titactions
                                                                       36 D
cttgggggtt ccctccccan accaaccccn ctgacaaaaa gtgccngccc tcaaatnatg
                                                                       420
teceggennt entigaaaca caengengaa ngtteteatt nteecenene cagginaaaa
                                                                       480
tgaagggtta ccatnittaa enecacetee aeniggennn geetgaatee temaaaanen
                                                                       540
eccteaanen aattnetnig ecceggtene gentingtee enceeggget eegggaanti
                                                                       600
caccconga annonning maschasit cogsassist tocompions tessitocco
                                                                       660
ennagaetht cetennenan encaattite tittonicae gaachegine ennaaaatgi
                                                                       720
nnnnenecte enetngteen naateneean e
                                                                       751
      <210> 40
      <211> 753
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(753)
      c223> n = A, T, C or G
      <400> 40
gtggfattft ctgtaagate aggtgtteet eectegtagg tttagaggaa acaeecteat
                                                                       60
agatgasaac rececegaga cageageact geasetgees ageageeggg gtaggagggg
                                                                      120
```

```
egeoptatge acagetggge cottgagaca geagggette gatgteagge tegatgteaa
                                                                        180
tggtetggaa geggeggetg tacetgegta ggggeacace gteagggece accaggaact
                                                                        240
                                                                        300
tőtcakagit ccappcaach tégítégésé kekedeggaga ccaggigain agetigeggi
cggtcataan cgcogbggcg tcgtcgctgg gagctggcag ggcctcccgc aggaaggcna
                                                                        360
                                                                        420
atawaggty cgcccccca ccgttcanct cgcacttctc naanaccaty angttgggct
cnaacccacc accanneegg actteettga nggaatteec aaatetette gntettggge
                                                                        490
ttetnetgat geectanetg gttgeeengn atgeeæanea neeceaanee deggggteet
                                                                        540
Amandaceen eutectentt temtetgggt tottetteece ggaeentggt teetetcamp
                                                                        600
gganeccata tetenaccan tactescent neceescent gmacceare ettetampa
                                                                        660
tteecneeg neetetggee entemanan gettneacha eetgggtetg cetteeceee
                                                                        720
incectatet gnacecemen titigietean int
                                                                        753
      <220> 41
      <211> 341
      <212> DNA
      <213> Homo sapien
      <400> 41
actatatrca tcaraacaga catgetteat ceratagact tettgacata getteasatg
                                                                        €Đ
agtgaaccca teettgattt atatacatat atgtteteag tattitggga geettteeac
                                                                       12D
ttetttaaae ettgtteatt atgaacaetg aaaataggaa tttgtgaaga gttaaaaagt
                                                                       d B E
tatagottgt ttacgtagta agtttttgaa gtotacatto aatocagaca ottagttgag
                                                                       240
Egitaaacig tgatittiaa aasstateat tigagaatat tetiteagag giattiteat
                                                                       300
ttttactttt tgattaattg tgttttatat attagggtag t
                                                                       341
      c210> 42
      <211> 101
      <212> DNA
     .c213> Homo gapien
      <400> 42
acttactgaa bitagitetg tgctcbtccb batbtagbgt bgtatcataa abacbtbgab
                                                                        60
gtttcaaaca ttctaaataa ataattttca gtggcttcat a
                                                                       101
      <210> 43
      <211> 305
      <212> DNA
      <213> Homo sapien
      <400> 43
                                                                        60
acatchtigh tacaghoraa gatgigthet taaabcacca theetheetg gheeteacce
                                                                       120
tocagggtgg totcacactg taattagage tattgaggag totttacage aaattaagat
                                                                       180
teagabgeet tgetaagtet agagttetag agttatgttt cagaaagtet aagaaaceea
cotottgaga ggtcagtaaa gaggacttaa tatttcatat ctacaaaatg accacaggat
                                                                       240
tggatacaga acqagagtta tcctggataa ctcagagetg agtacctgcc cgggggccgc
                                                                       30Q
tcgaa
                                                                       305
      <210> 44
      <211> 852
      <212> DNA
      <213> Homo sapien
      <23D>
      <221> misc_feature
      <222> (1)...(B52)
      <223> n = A,T,C or G
      <400> 44
```

```
acatasatat cagagasaag tagtottiga aatatitacg tocaggagit cittgttict
                                                                         б0
 gattatttgg tgtgtgtttt ggtttgtgtc caaagtattg gcagcttcag ttttcatttt
                                                                        120
 ctotocated togggdatte tteccasett tatataccag tottogtoca tocacaget
                                                                        180
 ccagaattte tettitetag taatatetea tagetegget gagettttea taggteatge
                                                                        240
 tgctgttgtt cttcttttt ccccataget gagecactgc ctctgatttc aagaacctga
                                                                        30D
 agacgccctc agatoggtet teccatteta ttaatootgg gttottgtot gggttcaaga
                                                                        36 D
 ggatgtcgcg gatgaattec cataagtgag tecetetegg gttgtgettt ttggtgtgge
                                                                        420
 acttggcagg ggggtcttgc tectttttca tatcaggtga ctctgcaaca ggaaggtgac
                                                                        480
 tggtggttgt catggagate tgageeegge agaaagtttt getgteease aaatetaetg
                                                                        540
tgctaccata ghtggtgtca tataaatagt tctngtcttt ccaggtgttc atgatggaag
                                                                        600
geteagtitig ticagieting acaatgacat tgtgtgtgga etggaacagg teactactge
                                                                        660
actggccgtt ceacttcaga tgctgcaagt tgctgtagag gagntgcccc gccgtccctg
                                                                       , 720
conceepagt gaacteetes assetestes tecasaggte etegeogtes atgresset
                                                                        780
cntpgaaagg pataceattg gcetccegct ggttggtgtc ceggeggtge tggegccect
                                                                        840
cccscscctg qt
                                                                        852
       <210> 45
       <211> 234
       <212> DNA
       <213> Homo sapien
       <400> 45
aceacagecc cttgctcgct aecgecctca tgctcatcae gttggacgae tccgtgtccg
                                                                        ٥D .
agtetgacar cateeggage ateageattg ettegeagtg ceetacegeg gggaactett
                                                                        120
geotegitte tggetggggt etgetggega acggeagaat geotacogtg etgeagtgeg
                                                                       180
tgaacgtgtc ggtggtgtct gaggaggtct gcagtaagct ctatgacccg ctgt
                                                                        234
       <210> 46
      <211> 590
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1) ... (590)
      <223> n = A,T,C or G
      <40D> 46
actititati taaatgitta taaggoagat otatgagaat gatagaaaac atggigtgita
                                                                        60
atttgatage aatattttgg agattacaga gttttagtaa traccaatta cacagttaaa
                                                                       120
angangatna tatatteesa gennataena natatetaat gaangateaa ggeaggaaaa
                                                                       160
tgantataac taattgacaa tggaaaatca attttaatgt gaattgcaca ttatccttta
                                                                       240
adagettted adanaaanda ttattgeagt etanttaatt eadaeagtgt taaatggtat
                                                                       300
caggatasan sactgaaggg canaasgaat taattttcac ttcatgtasc ncacccanat
                                                                       360
ttacaatggc ttaaatgcan ggaaaaagca gtggaagtag ggaagtantc aaggtctttc
                                                                       420
tggtctctas tctgccttac tctttgggtg tggctttgat cctctggaga cagctgccag
                                                                       480
ggctcctgtt atatccacaa tcccagcagc aagatgaagg gatgaaaaag gacacatgct
                                                                       540
geetteettt gaggagaett cateteactg geeaacaete agteacatgt
                                                                       590
      <210> 47
      <211> 774
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1).,.(774)
      <223> n = A,T,C or G
```

```
<400> 47
Acaaggggg ataatgaagg agtggggana gattttääag aagga&&&&& aacgaggccc
                                                                         60
tgaacagaat tittootgnac aacagggott caaaataatt ticttgggga gettcaagac
                                                                        120
gcttcactgc ttgaaactta aatggatgtg ggacanaatt ttctgtaatg accrtgaggg
                                                                        180
cattacagac gggactctgg gaggaaggat aaacagaaag gggacaaagg ctaatcccaa
                                                                        240
ascatesaag aaaggaaggt ggogteatae eteceageet acaeagttet eeagggetet
                                                                        300
cotextecct ggaggaegae agtegaggaa caactgacca tgtccccagg etcetgtgtg
                                                                        360
diggeteetg gietteagee cocagetetg gaageddaed eictgeigat deigegigge
                                                                        420
ecacactert tgaacacaca torroagett atablectigs acategoriga acctectatt
                                                                        480
cetacticeg agatgeetig etecetgeag cetgteaaaa teccaeteac cetecaaacc
                                                                        540
acggcatggg aagcetttet gacktgeetg attactecag catettggaa caatecetga
                                                                        600
ttccccactc cttagaggca agatagggtg gttaagagta gggctggacc acttggagcc
                                                                        660
aggetgetgg etteaaattn togeteattt aegagetatg ggaeettggg eaagtnatet
                                                                        720
teacttetat gggcnteatt tigttetace tgeaaaatgg gggataataa tagt
                                                                        774
      <210> 48
      <211> 124
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc feature
      <222> {1}...(124)
      \langle 223 \rangle n = A,T,C or G
      <400> 4B
canagattga aattttataa aaaggcattt ttetettata teeataaaat gatataattt
                                                                         60
tigraantat anaaaigtgi cataaattat aatgiteeti aattacagci caacgcaact
                                                                        120
tggt
                                                                        124
      <210> 49
      c211> 147
      <212> DNA
      <213> Homo sapign
      <220>
      <221> misc_feature
      <222> (1)...(147)
      <223> n = A,T,C or G
      <4DG> 49
googabgota chattitatt goaggaggtg ggggtgbbtt tattatteto boaacagott
                                                                        60
tytpyctaca gytyytytet gaetycatna aaaanttttt tacypytyat tycaaaaatt
                                                                        120
ttagggcacc catateresa grantgt
                                                                        147
      <210> 5D
      <211> 107
      <212> DMA
      <213> Homo sapien
      c40D> 5D
acattaaatt aataaaagga ctgttggggt tctgctaaaa cacatggctt gatatattgc
                                                                        60
                                                                       107
atggtttgag gttaggagga gttaggcata tgttttggga gaggggt
      <210> 51
      <211> 204
```

<212> DNA

120

```
<213> Homo sapien
      <400> 51
gteetaggaa gtetagggga cacaegaete tggggteacg gggcegaeac acttgcaegg
                                                                         60
CGGGAAGGAA AGGCAGAAA GtGACACCGt CAGGGGGAAA tGACAGAAAG GAAAAAAA
                                                                        120
gccttgcaag gtcagaaagg ggactcaggg cttccaccac agccctgccc cacttggcca
                                                                        18D
cetecetttt gggaccagea atgt
                                                                        204
      <210> 52
      <211> 491
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(491)
      <223> n = A, T, C \text{ or } G
      <400> 52
acaaagataa catttatett ataacaaaaa ttigatagii itaaaggita giatigigia
                                                                        €0
gggtattttc caaaagacta aagagataac tcaggtaaaa agttagaaat gtataaaaca
                                                                        120
ccatcagaca ggtttttaaa aaacaacata ttacaaaaatt agacaatcat ccttaaaaaa
                                                                       180
asaacttett gtatesattt ettittettes asstgaetga ettasptatt titaastatt
                                                                       240
teanasseer treetesass attiticaana tegiagetit canateinee eteagreesa
                                                                       300
atgitigatea gatawatwaa totogigaga actiaccaec caccacaage ittoigggge
                                                                       36D
atgeaacage gtetthteht toetthhet hitthith thacaggeac agaaachdat
                                                                       420
caalittatt tggataacaa agggtdicca aattatattg saasataaat ccaagitaat
                                                                       480
atcactcttg t
                                                                       491
      <210> 53
      <211> 484
      <212> DNA
      <213> Homo tapien
      <220>
      <221> misc_feature
      <222> (1)...(484)
      <223> n = A,T,C or G
      <400> 53
acataettta gragggotaa ttarcetaag atgotattta ttaanaqqtn tetqetrtqa
                                                                        60
gtattaacag tegetgaagt teggtattit tatgrageat tetettette eteteataac
                                                                       120
actacagaac critaaggac actgaaaatt agtaagtaaa gitcagaaac attagcigci
                                                                       1BD
coatcacate tetacataac actatogtaa ttacaacegtt aaacaacagt gttgacatet
                                                                       240
goactagtat anacogotoc totoaggata anactgott6 ggaacagaaa gggaaaaanc
                                                                       300
agchtigant thritigige igalangagg aaaggeigaa thaceilgit gectetreet
                                                                       360
aatgattggc aggtenggta aatneeaaaa catatteeaa etesaesett etttteeneg
                                                                       420
tanctigant etgigtatte caggancags eggatggaat gggecagece neggatgite
                                                                       480
cant
                                                                       484
      <210> 54
      <211> 151
      <212> DMA
      <213> Homo sapien
      <400> 54
actadacete gigetigiga acteeataea gaaaaeggig ceateeetga acaeggeigg
                                                                        60
```

ccactgggta tactgctgac aaccgcaaca aceassacac aastccttgg cartggctag

BNCDOCID- -WO 0124B0242TT -

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totalglock obcaagiged tittigting t
                                                                         151
      <210> 55
       <211> 91
       <212> DNA
       <213> Homo sapien
      <400> 55
acctggettg teteegggtg gtteeeggeg ceeeceacgg teeccagaac ggacacttte
                                                                         60
greeteragt goetactoga gecassotog t
                                                                         91
      <210> 56
      <211> 133
      <212> DNA
      <213> Homo gapien
ggoggatgig ogttggttat atacaaatat gtcattttat gtaagggact tgagtatact
                                                                         бD
tggatttttg gtatötgtgg gttgggggga oggtocagga accaatacce catggatacc
                                                                        120
aagggacaac tgt
                                                                        133
      <210> 57
      <211> 147
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc_feature
      <222> (1)...(147)
      <223> n = A, T, C or G
      <400> 57
Actotsgaga accogagoog obsetoogoo totsggatga ggtgatgcan gengtggogo
                                                                         60
gactgggage tgageeetté cetttgegee tgeeteagag gattgttgee gacntgeana
                                                                        120
totcantggg ctggatncat gcagggt
                                                                        147
      <210> 58
      <211> 198
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(198)
      <223> A = A,T,C or G
      <400> 58
acagggatat aggittmaag tiatiginat igtaaaatac atigaatitt cigtatacic
                                                                         60
tgattacata catttateet ttaaaaaaga tgtaaatett aatttttatg ceatetatta
                                                                        120
atttaccaat gagitacett giaaatgaga agteatgata geaetgaatt tiaactagtt
                                                                        180
ttgacttcta agtttggt
                                                                        198
      <210> 59
      <211> 330
      <212> DWA
      <213> Homo sapien
     <400> 59
```

acaacaaatg gettgtgagg aagtottato agcaaaactg gigalggcta cigaaaagat	60
ccattgaaaa ttatcattaa tgattttaaa tgacaagtta tcasaaactc actcaatttt	120
cacctgtgct agentgctaa aatgggagtt aactctagag caaatatagt atcttctgaa	180
tacagicaal assigscasa goosgggoot acaggiggit tocagactit coagaccosg	24 D
cagaaggaat ctattttatc acatggatet cogtetgtge teamaatacc taatgatatt	300
tttcgtcttt attggacttc tttgaagagt	330
<210> 60	
<211> 175	
<213> DNA	
<213> Homo sapien	
<40D> 60	;
accgtgggtg cettetacat teetgaegge teetteacea acatetggtt etaettegge	
gregregget cettestett catesteate cagetegtge tgetcatega etttgegeac	50
feetdawee waeshtaach aaacamaade awaamataa afeeshee afeeshee	120
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	175
<210> 61	
<211> 154	
<212> DNA	
<213> Homo sapien	
• • • • • • • • • • • • • • • • • • • •	
<400> 61	
accecacttt teeteetgtg ageagtetgg actteteact getacatgat gagggtgagt	60
ggttgttgct cttcaacagt atcctccct ttccggatct gctgagccgg acagcagtgc	120
tggactgcac agccccgggg ctccacattg ctgt	154
<210> 62	
<211> 30	
<212> DNA	
<213> Homo sapien	
<400> 62	
cgctcgagcc ctatagtgag togtattaga	
-33afec cracadedad codestruida	30
<210> 63	
<211> 89	
<212> DNA	
<213> Homo sapien	•
<400> 63	
acaagteatt teageaceet ttgetettea aaaetgacea tettttatat ttaatgette	60
ctgtatgaat aaaaatggtt atgtcaagt	8.9
<210> 64	
<211> 97	
<212> DNA	
<213 > Homo sapien	
<400> 64	
accggagtaa ctgagtcggg acgctgaatc tgaatccacc aataaataaa ggttctgcag	<b>6</b> 0
aatcagtgca tocaggattg gtoottggat otggggt	97
<210 > 65	
<211> 377	
<212> DNA	
<213> Homo sapien	

```
<220>
       <221> misc_feature
       <222> (1)...(377)
       <223> \pi = A, T, C \text{ or } G
       <40D> 65
acaaceanae ntocottott taggocactg atggaaacct ggaaccccot tttgatggca
                                                                         €D
geatggogte etaggeettg acaeagogge tggggtttgg getnteecaa acegeacaee
                                                                         12D
ecaaccetgg tetacceaca nttetggeta tgggetgtet etgecactga acateagggt
                                                                         180
toggtoataa natgaaaboo caanggggac agaggtoagt agaggaagot caatgagaaa
                                                                         240
ggtgctgttt gctcagccag aaaacagctg cctggcattc gccgctgaac tatgaacccg
                                                                         300
tgggggtgaa ctacccccan gaggaatcat gcctgggcga tgcaanggtg ccaacaggag
                                                                        360
gggogggagg agcatgt
                                                                        377
      <210> 66
      <211> 305
      <212> DNA
      <213 > Homo sapies
      <400> 66
acgorithed ofcagaatte agggaagaga ofgtogoofg coffeeterg figtigogig
                                                                         БD
agaaccegtg tgcccettce caccatatce accetegete catetttgaa etcaaacaeg
                                                                        120
aggaactaac tgcaccctgg teststesse agtesseagt tsacestesa tsstsacet
                                                                        180
tectecacte taagggatat caacactgee cageacaggg greetgaatt tatgtggttt
                                                                        24 D
ttatatattt tttaataaga tgeactttat gteattttt aataaagtet gaagaattae
                                                                        300
tgttt
                                                                        305
      <210> 67
      <211> 385
      <212> DWA
      <213> Homo sapien
      <400> 67
actacacaca ctccacttgc ccttgtgaga cactttgtcc cagcacttta ggaatgctga
                                                                         ŧο
99tc99acca gccacatete abstscaaga ttgcccagca gacatcaggt ctgagastte
                                                                        120 .
certitiana anagggsett tyrttammam mgamgtetag comegattyt gtagagemge
                                                                        180
tgtgctgtgc tggagattca cttttgagag agttctcctc tgagacctga tctttagagg
                                                                        240
ctgggcagtc ttgcacatga gatggggctg gtctgatctc agcactcctt agtctgcttg
                                                                        30D
cototoccas ggccccasco tggccacaco tgcttacags gcactotcaq atqcccatac
                                                                        360
catagittet gigetaging accet
                                                                        385
      <210> 68
      <211> 73
      <212> DNA
      <213> Homo gapien
acttaaccag atatatettt accecagatg gggatattet ttgtaaaaaa tgaaaataaa
                                                                         60
gtttttttaa tgg
                                                                         73
      <210> 69
      <211> 536
      <212> DNA
      <213> Homo sapien
      <220×
      <221> mist_feature
      <222> (1)...(536)
```

```
\langle 223 \rangle n = A,T,C or G
      <400> 69
actagtocas tgtggtggaa ttccattgtg ttgggggctc tcaccctcct ctcctgcage
                                                                         60
Eccagetttg tgctctgcct ctgaggagac catggcccag catctgagta ccctgctgct
                                                                         120
cotypiggod accotagoty tygocotygo otygagoddd aaggaggagg ataggataat
                                                                         180
coopygtygo atchateacy cayacchina tyatyaytyy ghacagogty chichcacht
                                                                        24D
egreateago gagtataaca aggeeaccaa agatgactae tacagacgto egetgegggt
                                                                        300
Actaagagee agacaacaga cegtiggggg ggigaattac ticticgacg tagaggiggg
                                                                        360
cogaaccata tgtaccaagt cocagoocaa cttggacace tgtgccttcc atgaacagec
                                                                        420
agasetgeag aagaaacagt tgtgetettt egagatetae gaagtteeet ggggagaaca
                                                                        400
gaangtooot gggtgaaato caggtgtosa gaaateetan ggatetgttg ocagge
                                                                       . 536
      <210> 70
      <211> 477
      <212> DNA
      <213> Homo sapien
     <4005 7D
atgaceceta acappagece teteagecet cetaatgace teeggeetag ceatgtgatt
                                                                         60
tracttocac tocataecge tecteatact aggectacta accascacac taaccatata
                                                                        120
creatgatgg cgcgatgtma cacgagasag cacataccaa ggccaccaca caccacctgt
                                                                        180
ccaasaagge cttcgatacg ggataatect atttattace teagaagttt tttbettege
                                                                        240
agggattitt otgagootit taccactoca gootagoooc taccccccaa ctaggagggo
                                                                        300
actggeocce ascaggeste accopyctas atrocctaga agtcccacto ctasacacat
                                                                        36 D
ccqtattact cgcatcagga gtatcaatca cctgagctca ccatagtota atagaaaaca
                                                                        420
acogaaacca aattatteaa agcaetgett attacaattt tactgegtet etatttt
                                                                        477.
      c210> 71
      <211> 533
      c212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (533)
      \langle 223 \rangle n = A,T,C or G
      <400> 71
agagetatag giacagigig ateteagett igeaaacaca tittetacat agatagiaet
                                                                         6 D
aggiatiaat agataigiaa agaaagaaat cacaccatta ataaiggiaa gatiggiida
                                                                        120
tgtgatttta gtggtatitt tggcaccett atatatgttt tecaaacttt cagcagtgat
                                                                        180
attattteea taacttaaaa agtgagtttg aaaaagaaaa totocagcaa gcatotoatt
                                                                        240
tasetesegg trigicatet trasessiar agreatatgt gactititas sesagetgte
                                                                        300
Asstaggtgt gaccotacta ataattatta gaaatacatt taaaaacatc gagtacctca
                                                                        360
agtcagtttg cottgaaaaa tatcaaatat aactottaga gaaafgtaca taaaagaatg
                                                                        420
ettegtaatt tiggagtang aggiteeete eteaatitig tattittaaa aagtacatgg
                                                                        480
taaaaaaaaa aattoacaac agtatataag getgtaaaat gaagaattet gee
                                                                        533
      <210> 72
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BNSDOCID: <WO___0134802A2TI_>
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<211> 511 <212> DNA

<220×

<213> Homo sapien

<221> misc\_feature
<222> {1}...{511}
<223> n = A.T.C or G

```
<400> 72
                                                                         60
tattacggaa aaacacacca cataattcaa ctancaaaga anactgotto agggcgtgta
azatgasagg cttccaggca gttatctgat tasagaacac tasaagaggg acaaggctaa
                                                                        120
aagoogeagg atgtotacac tatancaggo gotatttggg ttggctggaag gagotgtgga
                                                                        180
aaacatggan agattggtgc tgganatcgc cgtggctatt cctcattgtt attacanagt
                                                                        24D
gaggttetet gtgrgeeeae tggtttgaaa aeegttetne aataatgata gaatagtaea
                                                                        30D
cacatgagaa ctgaaatggc ccaaacccag aaagaaagcc caactagatc ctcagaanac
                                                                        36D
gettetaggg acaataaccg atgaagaaxa gatggeetee tégtgeecee gtebgttabg
                                                                        420
atttetetee attgeagena naaaceegtt ettetaagea aacneaggtg atgatggena
                                                                        480
aaatacaccc octottgaag naccnggagg a
                                                                        511
      <210> 73
      <211> 499
      <212> DNA
      <213 > Nomo sapien
      <220>
      <221> misc_feature
      <222> (1) ... [499)
      <223> n = A,T,C or G
      <400> 73
cagtoccape actogtocca gtaccaptec caataacagt gccagtocca gtoccagcac
                                                                         60
                                                                        120
cagtogtoge tteagtoeto ottoecaseet gaccoccaet eteacattio ogetettege
                                                                        180
tggocttggt ggagetggtg ceageaceag tggeagetet ggtgeetgtg gttteteeta
caagtgagat tttagatatt gttaateetg ceagtettte tetteaagee agggtgeate
                                                                        240
                                                                        300
ctragamace tactement agenetatag geagecacts temmicant gamgitgaca
                                                                        360
ctotgoatta aatotatttg coatttotga aaaaaaaaaa aaaaaaaggg oggoogotog
antetagagg gooogtttaa accepetgat capectegae tytgeettet anttgeeage
                                                                       420
catetgitgi tigecectee coegniquet teetigador iggaaagige cadicocaci
                                                                       480
                                                                       499
gtcctttcct aantaaaat
      c210> 74
      c211> 537
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (537)
      <223> n = A, T, C or G
      <400> 74
                                                                        60
tttcatagga gaacacactg aggagatact tgaagaattt ggattcagcc gcgaagagat
                                                                       120
ttateagett aacteagata aaateattga aagtaataag gtaaaageta gtetetaaet
todaggooda dggotdaagt gaatttgaat actgoattta cagtgtagag taacacataa
                                                                       190
cattgtatgc atggasacat ggaggsacag tattscagtg tcctaccact ctsatcaaga
                                                                       240
                                                                       300
asagaattac agactctgat tctacagtga tgattgaatt ctaaaaatgg taatcattag
                                                                       360
ggettttgat ttataanact ttgggtactt atactaaatt atggtagtta tactgccttc
                                                                       420
cagtitigati gatatatitig tigatatiaa gaticitigae tiatatitiig aatgggtict
                                                                       480
actgaazaan gaatgatata tücttgazga categatata caüttattta cactetügat
totacaatgt agaaaatgaa ggaaatgccc caaattgtat ggtgataaaa gtcccgt
                                                                       537
      <210> 75
      <211> 467
      <212> DNA
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<213> Homo sapien

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<230>
       <221> misc feature
       <222> (1)...(467)
       <223> n = A,T,C or G
       <400> 75
 casanacest tottcasses stockets tecectects ctgcagetca casacecete
                                                                         60
 tgcatattac acgtacetec tectgetect caagtagtgt ggtetatttt gecateatea
                                                                        120
 cetgetgtet gettagaaga acggetttet getgeaangg agagaaatea taacagaogg
                                                                        180
 tggcacaagg aggccatctt ttcctcatcg sttattgtcc ctagaagcgt cttctgagga
                                                                        240
 totagitiggg citicitict gggttigggo cattleanti eleatgigig tactaticla
                                                                      , 300
 trattattat ataacagtit tesascongt gagesonesa sassociese tetatestas
                                                                        360
castgaggaa tagccacggt gatctccagc accasatete tecatgttnt tecagagete
                                                                        420
etecagecaa eccaaatage egetgetatm gtgtagaaca tecetgo
                                                                        457
       <210> 76
       <211> 400
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1) ... (400)
       <223> n = A,T,C or G
       <400> 76
aagetgacas cattoggsec sagatstete setecstage ettagetgts etegesetae
                                                                         60
tetetette tygeetygag getatecage gtactecaaa gatteaggtt tacteaegte
                                                                        120
atccagcaga gaatggaaag tcaaatttcc tgaattgcta tgtgtctggg tttcatccat
                                                                       180
cogacattga agttgactta ctgaagaatg gagagagaat tgaaaaagtg gagcattgag
                                                                       240
actigicant cageaaggae iggicitics atcictigia clacacigaa itcacceca
                                                                       300
ctgaaaaaga tgagtatgcc tgccgtgtga accatgtgac tttgtcacag cccaagatng
                                                                       360
ttnagtggga toganacatg taagcagcan catgggaggt
                                                                       400
      <210> 77
      <211> 248
      <212> DNA
      <213> Homo gapien
      <400> 77
ctggagtgcc ttggtgtttc aageceetgc aggaagcaga atgcaecttc tgaggeacet
                                                                        бÔ
ceagetgeed degegegea todesegete geageaceet todesegete coattoots
                                                                       120
caggeactgt teateteage tittetgice cittgeteec ggcaageget teigeigaaa
                                                                       180
gttcatatct ggagcctgat gtcttaacga ataaaggtcc catgctccac ccgaaaaaaa
                                                                       240
aaaaaaa
                                                                       248
      <210> 78
      c211> 201
      <212> DNA
      <213> Homo sapien
      <400> 78
actagiccas igiggiggaa ticcatigig tigggcccaa cacaatggct acctitaaca
                                                                        6 D
traceragae ecogorotor regtorerea egetortort aacqueagta toatortae
                                                                       120
trigotaric ggasaciati titalgiasi taalgialge titcligitt alaasigeet
                                                                       780
gatttaaaaa aaassaaaaa a
                                                                       201
```

```
<210> 79
      <211> 552
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(552)
      <223> n = A, T, C or G
      <400> 79
tccttttgtt aggtttttga gacaacccta gacctaaact gtgtcacaga cttctgaatg
                                                                         60
tttaggcagt gotagtaatt teetegtaat gattetgtta ttaettteet attetttatt
                                                                        120
cetetteett etgaagatta atgaagttga saattgaggt ggataastae aasaaggtag
                                                                        180
tgtgatagta taagtatcta agtgcagatg maagtgtgtt atatatmtcc attcaaaatt
                                                                        240
atgraagtta gtaattactc agggttaact aaattacttt aatatgctgt tgaacctact
                                                                        300
otyttootty gotagaaaaa attataaaca ggactttytt agtttyygaa gocaaattya
                                                                        360
taatattota tyttotaaaa gitoggotat acataaanta tnaagaaata tyyaattita
                                                                        420
ttcccsggsa tatggggttc atttatgast antacccggg snagsagttt tgantmsaac
                                                                        480
engittiggi taatacgita atatgicein aainaacaag genigacita iiiceaaaaa
                                                                        540
aasaasaaa aa
                                                                        552
      <210> 80
      <211> 476
      <212> DNA
      c213> Homo gapien
      <220>
      <221> mis¢ feature
      <222> (1)...(476)
      <223 n = A,T,C or G
      <400> BO
acagggatit gagatgotaa ggooccagag atogtitgat ocaacootot tattitoaga
                                                                        6 D
ggggaaaatg gggcctagaa gttacagage atctagctgg tgcgctggca cccctggcct
                                                                       120
racacagact crigagtago tyggactara ygracaragt cartgaagca ggrcctgttt
                                                                       180
gcaattcacg tigccaccic cmactimams atticticata igigatgicc tiagicmica
                                                                       240
aggitaaact tioccaccca gaaaaggcaa citagataaa atcitagagt actitcatac
                                                                       300
totictaagt cototiccag cotcactitg agtoctcott gggggttgat aggaaninto
                                                                       36Q
tottggettt etraataana tetetateea tetetatgttt aatitggine gentaanaat
                                                                       420
gctgaaaaa ttaaaatgtt ctggtttcnc tttaaaaaaa aaaaaaaaa aaaaaaa
                                                                       476
      <210> B1
      <211> 232
      c2125 DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(232)
      <223> n = A,T,C or G
      <400> B1
tittittitig tatgeenten etgiggngit attgitgetg eeacestgga ggageecagi
                                                                        60
ttottotgta totttotttt otgggggate ttootggoto tgoccotcca ttoccagoot
                                                                       120
ctcatcecca tottgcactt ttgctagggt tggaggcgct ttcctggtag cocctcagag
                                                                       180
actragtcag rgggaataag tootaggggt ggggggtgtg gcaagergge rt
                                                                       232
```

```
<210> 82
      <211> 383
      <212> DNA
      <213> Homo sepien
      <220>
      <221> misc feature
      <222> (1) ... (383)
      <223> n = A, T, C or G
      <400> 82
aggogggage agaagetaaa gecaaageee aagaagagtg geagtgeeag daetggtgee
                                                                       60
agtaccagta ccaataacat gccagtgcca gtgccagcac cagtggtggc ttcagtgctg
                                                                        120
gigerageet gacegeeact cicaeattig ggetetiege tggeetiggt ggagetggig
                                                                        180
ccagcaccag tggcagctct ggtgcctgtg gtttctccta caagtgagat tttagatatt
                                                                       240
gttaatcotg coagtottto tottcaagee agggtgeatc otcagaaace tacteaacac
                                                                       300
agcactetng geagecacta tematematt gangttgmen etetgeattm amtetatttg
                                                                       360
ccatttcaae aaesaesaa aea
                                                                       28E
      <210> 83
      <211> 494
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc feature
      <222> {1}...(494)
      <223> n = A, T, C or G
      <400> 83
acceaattee gaccectees ttataagcea teateteete caetattace teaaceaeca
                                                                        60
gggagatrga gtctatargc tgaagaaatt tgarccgatg ggaraacaga crtgctcagr
                                                                       120
coatcotget eggittetece cagatgacaa atactetega cacegaatea ceateaagaa
                                                                       180
acgetteaag gigeteaiga eccageaace gegeeeigte eteigagggi cettaaacig
                                                                       240
atgtetttte Egecacetgt taccectogg agacteegta Acceaactet teggactgtg
                                                                       300
agreetgatg cettitigge agreatacte titiggentre agtetotegt ggegatigat
                                                                       36D
tatgettgtg tgaggeaate atggtggeat cacceatnaa gggaacaeat ttgantttt
                                                                       420
ttteneatat tttaaattae naecagaata ntteagaata aatgaattga aaaactetta
                                                                       480
888855555
                                                                       494
      <210> 84
      <211> 38D
      <212 > DNA
      <213 > Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(380)
      <223> n = A,T,C or G
      <400> 84
gctggtagcc tatggcgtgg ccacggangg gctcctgagg cacgggacag tgacttccca
                                                                        E۵
agtatectge geogegtett ctacegteec tacetgeaga tettegggea gattecceag
                                                                       120
gaggacatgg acgtggccct catggagcac agcaactgct ogtoggagcc oggettetgg
                                                                       18D
gracaffető etggggerea ggfgggeace tgegtetece agtabgecaa etggebggtg
                                                                       240
gtgctgctcc tegtcatett cetgetegtg gccaacatee tgctggtcac ttgctcattg
                                                                       300
cratgiticas tiacacatic gecazagiae agggeaacas chaicietae igggaaggee
                                                                       360
agegttneeg ceteateegg
                                                                       380
```

```
<210> 85
      <211> 481
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(481)
      \langle 223 \rangle n = A,T,C or G
      <400> 85
gagttagete etecaqaaqo ttgatgaggt egtetgeagt ggeetetege tteatacege
                                                                          60
tnecategic atactgtagg titgecacca cetectgest ctiggggegg ctaatatees
                                                                         120
ggasactete sateaagtea cegtenatna aacetgtgge tggttetgte tteegetegg
                                                                         180
tytgaaagga totocagaag gagtgoboga tottococac actittgatg actitattga
                                                                        240
gtrgattrtg catgircage aggaggitgi accagetete tgacagigag gicaccagec
                                                                        300
ctateatger nttgaacgtg cegaagaaca cogageettg tgtggggggt gnagteteac
                                                                        360
ccagattotg cattaccaga nagcogtggc aaaaganatt gacaactogc ccaggnngaa
                                                                        420
aaagaacacc teetggaagt geingeeget eetegteent tggtgginge gentneettt
                                                                        4 B O.
                                                                        461
      <210> 86
      <211> 472
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc_feature
      <222> (1)...(472)
      <223> n = A, T, C or Q
      <400> 86
ascatettee tytataatye tytytaatat eyateeyatn ttytetyety ayaatteatt
                                                                         БQ -
actiggeess greectines gortggerst tygtattess ettracests tyrescatt
                                                                        120
tsaacsgigt gicaatcige teecitacti igicateace agicigggaa taagggiaig
                                                                        180
occiations accigitana aggiogotan goattitiga ticancatoi tittittiga
                                                                        240
cacaagtoog aaaaaaagcaa aagtaaacag tinttaatti gitagccaat teactificti
                                                                        300
catgggaceg egccatttga ttteezeegc easttgceta etattgegct ttgggegctg
                                                                        360
atainigage ggmagantag cettictaet teaccagaea caacteetti cataiiggga
                                                                        420
tyttnacnaa agttatytet ettacagaty gyatgetttt gtygeaatte ty
                                                                        472
      <210> 87
      <211> 413
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(413)
      <223> n = A,T,C or G
      <400> 87
agazaceagt atetetnama acameetete atmeettyty gacetmattt tytytyoyty
tytytytycy cycataltat ategacegyc acatottttt tactitlyta aeegottaty
                                                                        120
ectettiggt atctatatet gigaaagtit taaigatetg ceataaigte tiggggaeet
                                                                        160
ttgtcttctg tgtaaatggt actagagaaa acacctatnt tatgagtcaa tctagttngt
                                                                        240
tttattegae atgaaggaaa ttteeagatn acaacaetna caaactetee ettgaetagg
                                                                        300
```

```
ggggacaaag aaaagcanaa ctgaacatna gaaacaatto cctggtgaga aattnoataa
                                                                        360
acagaaattg ggtngtatat tgaaananng catcattnee acgttttttt ttt
                                                                         413
      <210> 88
      <211> 448
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...[448]
      <223> n = A.T.C or G
      <400> 88
egeageggst cotetetate tagetecage etetegeetg ecceaetece egegtecege
                                                                         6 D
gtoctageen accatggeog ggecectgeg egececgetg etectgeteg ccatcetgge
                                                                        120
ogtggcoutg googtgager orgoggergg eteragizere ggeaagerge egegertiggt
                                                                        180
gggaggecca tggaccccgc gtggaagaag aaggtgtgcg gcgtgcactg gactttgccg
                                                                        240
teggenanta caacaaacce geaacnactt ttaccnagen ogegetgeag gitgtgeege
                                                                        300
cocaancaaa ttgttactng gggtaantaa ttottggaag ttgaacctgg gccaaacnng
                                                                        360
tttaccagaa conagccaat ingaacaati necectecat aacageeeet titaaaaaagg
                                                                        420
gaancantco tontotttto caaatttt
                                                                        448
      <210> 89
      <211> 463
      <212 > DNA
      <213> Homo sapien
      <220×
      <221> misc_feature
      <222> (1)...(463)
      <223> n = A, T, C or G
      <400> 89
gaattttgtg cactggccac tgtgatggaa ceattgggce aggatgcttt gagtttatca
                                                                         60
glagigatic igccaaagit ggigligtaa catgagtaig taaaaigica aaaaattago
                                                                        120
agaggtotag gtotgcatat cagcagacag tttgtcogtg tattttgtag cettgaagtt
                                                                        180
ctcagtgaca agtinntict gatgcgaagt tetnaticca gtgttttagt ceittgcatc
                                                                        240
tttmatgttn agasttgsst statnaaatt getttigini teigeaggia etatelgigg
                                                                        300
ttteaceasa tegesnnact tototgottn gasnatttga atatottaca totnaasatn
                                                                        D8E
aattetetee eestannaaa acceangeee tiggganaat tigaaasaang gnicettenn
                                                                        420
aattonnana anttoagntm toatacaaca naacngganc ccc
                                                                        463
      <210> 90
      <211> 40D
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      c222> (1)...(4D0)
      \langle 223 \rangle n = A,T,C or G
      <400> 90
agggattgaa ggtothttnt actgtoggae tgttcancca ccaactctac aagttgetgt
                                                                         60
ottoractra cigicigiaa genintiaac ecagactgia tetteataaa tagaacaaat
                                                                        120
tetteaceag teacatette taggacettt tiggatteag tiagtataag etetteexet
                                                                        180
teettigita agaetteate tygiaaagte ttaagittig tagaaaggaa titaattget
                                                                        240
```

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cgttctctaa caatgtcctc tccttgaagt atttggctga acaacccacc tnaagtccct
                                                                         300
 ttgtgcatcc attttaaata tacttaatag ggcattggtn cactaggtta aattctgcaa
                                                                         360
 gagteatetg tetgemaaag ttgogttagt atatetgeca
                                                                         400
       <210> 91
       <211> 490
       <212> DNA
       <213> Homo sapien
       <220×
       <221> micc_feature
       <222> (1)...(480)
       \langle 223 \rangle n = A,T,C or G
       <400> 91
gageteggat ccaataatet tigietgagg geageacaea taincagige caiggnaaci
                                                                          60
ggtctacccc acatgggagc agcatgccgt agntatataa ggtcattccc tqagtcagac
                                                                         120
 atgeetettt gaetaeegtg tgeeagtget ggtgattete acacacetee nneegetett
                                                                         180
 tytyysaassa ctyycactty notygaacta goasgacate acttacaast teseccacya
                                                                         240
gacarttgaa aggtgtaaca aagegartet tgcattgrtt tttgtccctc cggcaccagt
                                                                         300
tgtcaatact aaccegetgg tttgcctcca tcacatttgt gatctgtage tctggataca
                                                                         360
totoctyaca gtactgaaga acttottott ttgtttoaaa agcaactott ggtgootgtt
                                                                         420
ngatcaggtt cccatttccc agtccgaatg ttcacatggc atainttact tcccacaaaa
                                                                         480
      <310> 92
       <211> 477
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(477)
      <223> n = A,T,C or G
      <400> 92
atacagecca nateccaeca egaagatgeg ettyttgaet gagaacetga tgeggteaet
                                                                         60
ggtorogety tagococago gactotocae otgotggaag oggttgatge tgcactoott
                                                                        120
cccacgcagg cagcagcggg gccggtcaat gaactccact cgtggcttgg ggttgacggt
                                                                        180
taantgcagg aagaggotga ccacctcgog gtocaccagg atgcccgact gtgcgggacc
                                                                        240
tgcagogaaa ctcctogatg gtcatgagog ggaagcgaat gangcccagg gccttgccca
                                                                        300
gaacetteeg cetgttetet ggegteacet geagetgetg cegetnacae teggeetegg
                                                                        360
accagrager assesgeett gesesgeege seetcaeggs tgeccantgt gtegegetee
                                                                        420
aggaacggcn ccagcgtgtc caggtcaatg tcggtgaanc ctccgogggt aatggog
                                                                        477
      <210> 93
      <2115 377
      <212> DWA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(377)
      <223> n - A,T,C or @
      <400> 93
gaarggetgg accttgeete geaftgtget getggeagga atacettgge aageagetee
                                                                        бΟ
agteegagea gecoeagace getgeegeee gaagetaage etgeetetgg eetteeeete
                                                                       120
cuctoaats tagaaccant agtgggagca ctgtgtttag agttaagagt gaacactgtn
                                                                       180
```

```
tgattttact tgggaattte etetgttata tagettttee caatgetaat ttecaaacaa
                                                                       240
cascaacaaa ataacatgtt tyeetgttna gttgtataaa agtangtgat tetgtatnta
                                                                       300
aagesaatet tartyttere tetertyrtt graenticty tetttettyy tortrtyyaa
                                                                       360
                                                                       377
atabatatat tattaas
      <210> 94
      <211> 495
      <212> DNA
      <213> Homo capien
      <220>
      <221> misc_feature
      <222> (1)...(495)
      <2235 n = A,T,C or G
      <400> 94
contrigage egitagege captiones tegaseass agencages santeogter
                                                                        60
cyayetyany cayattteec acaytyacco cagageeety gyetatayte tetgaceeet
                                                                       120
cceaggaeag accecettet ggggacatgg getggaggge aggacetaga ggcaccaagg
                                                                       16D
                                                                       240
gaaggcccca ttcoggggct gttccccgag gaggaaggga aggggctctg tgtgccccc
                                                                       300
acgaggaana ggccctgant cotgggatea nadacecett caegigtate eccacacaaa
                                                                       360
tgcaagetea ceaaggteee eteteagtee etteeetaca eestgaacgg neastggsse
acacceacce agancancea ecegecatgg ggaatgtnet caaggaateg engggeaacg
                                                                       420
                                                                       480
tggactetng tecennaagg gggeagaate tecaatagan gganngaace ettgetnana
                                                                       495
ABARA BORBERRER
      <210> 95
      <211> 472
      <212> DNA
     <213> Homo sapien
     <220×
      <221> misc feature
      <222> (1) ... (472)
      <223 > n = A,T,C or G
      <400> 35
                                                                        60
ggttacttgg tttcattgcc accaettagt ggatgtcatt tagaaccatt ttg&ctgctc
cetetggaag cettgegeag ageggaettt gtaattgttg gagaataaet getgaatttt
                                                                       120
tagetgtttt gagttgatte geaceactge accaeacte aatatgaasa etattinaet
                                                                       180
tetttattat cttgtgeesa gtatacaatg saaattttgt tcatactgta tttatcaagt
                                                                       240
                                                                       300
atgatgazaa gcaatagata tatattottt tattatgttn aattatgatt gccattatta
atoggoassa tgtggagtgt atgttetttt cacagtaata tatgcetttt gtsacttoac
                                                                       360
ttggttattt tattgtaast gaattacass attcttaatt taagasaatg gtangttats
                                                                       420
tttanttcan taatttcttt ccttgtttac gttaattttg aaaagaatgc At
                                                                       472
      <210> 96
      <211> 476
      <212> DNA
      <213> Romo gapien
      c220>
      <221> misc_feature
      <222> (1) ... (476)
      <223> n = A,T,C or G
      <400> 96
ctgaagcatt tottcaaact thtotacttt tgtcattgat acctgtagta agttgacaat
                                                                        60
```

```
gtggtgaaat ticaaaatta taigtaacti olaefagtti tactitotoo cccaagicti
                                                                        120
 ttttaactca tgatttttac acacacastc cagaacttat tatalagcct ctaagtcttt
                                                                        180
 attetterea gragatgatg asagagteet ceagtgtett gngcanaatg tietagntat
                                                                        240
 agetggatac attengtggg agttetataa acteatacet cagtgggact naaccaatat
                                                                        300
 tgtgttagte teaatteeta ceacactgag ggageeteec aaateactat attettatet
                                                                        36Q
 gcaggtacto otocagaaxa acngacaggg caggottgca tgaaaxagtn ecatotgogt
                                                                        420
 tacaaagtot atottootca mangtetgth aaggaacaat ttaatottot agettt
                                                                        476
       <210> 97
       <211> 479
       <212> DNA
       <213> Homo sapien
       <22D>
       <221> misc feature
       <222> {1|...[479]
       <223> n = A,T,C or 0
       <400> 97
actictiteta atgetgatat gatettgagt ataagaatge atatgteact agaatggata
                                                                         60
aaataatgot goaaacttaa tgitcitaig caaaatggaa cgctaaigaa acacagctta
                                                                        330
castograma trammactra campigatem tetgttgtag atttagtgtm atmagacttm
                                                                        180
gattgtgctc cttcggatat gattgtttct canatcttgg gcaatnttcc ttagtcaaat
                                                                        240
caggotacta gaattotgtt attggatatn tgagagoatg aaatttttaa naatacaott
                                                                        300
gtgattatna aattaatoac aaatttcact tatacctgct atcagcagct agaaaaacat
                                                                        360
ntmnttttta natcaaagta ttttgtgttt ggaantgtnn aaatgaaatc tgaatgtggg
                                                                        420
ttonatotta tittitooon gachactant incitittia gagnetatto iganecato
                                                                        479
       <210> 98
       <211> 461
       <212> DNA
       <213 > Homo gapien
       <400> 98
aptgacttpt cotocaacaa aaccocttga tcaagtttgt ggcactgaca atcagaceta
                                                                         60
tgctagttcc tgtcatctat tegetactaa atgcagaetg gaggggaeca aaaaggggea
                                                                        120
tcaactecag ciggattait tiggageets caaatetati ectaettsia eggactitga
                                                                        180
agtgatteag ttteetetae ggatgagaga etggeteaag aatateetea tgeagettta
                                                                        240
tgaagccact ctgaacacgc tggttatcta gatgagaaca gagaaataaa gtcagaaaat
                                                                        300
Ptacetggag asaagagget tiggetgggg accatereat igaacettet ettaaggaet
                                                                        350
ttaagaaaaa ctaccacatg ttgtgtatcc tggtgcoggc cgtttatgaa ctgaccaccc
                                                                        420
.tttggaataa tottgaegot ootgaacttg otcototgog a
                                                                        451
      <210> 99
      <211> 171
      <212> DNA
      <213> Homo sapien
      <400> 99
ptggcogcgc gcaggtgttt cotegtaceg cagggeceec tecetteeee aggegteeet
                                                                        60
                                                                       120
eggegeetet gegggeeega ggaggagegg etggegggtg gggggagtgt gacccaccet
                                                                       171
cggtgagaam agoottotot agegatotga gaggegtgee ttgggggtae c
      <210> 100
      <211> 269
      <212> DNA
      <213> Homo sapien
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<211> 578 <212> DNA

<213> Homo sapien

<400> 100						
cggccgcaag tgcaactcca gctggggccg tgcggacgaa gattctgcca gcagttggtc	60					
cgactgogac gacggoggeg gegacagteg caggtgeage gegggegeet ggggtettge	120					
calocaldaso sastocodat assatabadsa accteatata acceteata sastateatata sadactasao raseacodes astateatat escateeese ascettases ecateatata	180 240					
caedederet aceadatatea aradecato	269					
-5-3-5 555+5+-5 g-2g-cg-c	203					
<210> 101						
<211> 405						
<212> DNA						
<213> Homo Bapien	;					
<40D> 1D1						
ttttttttt ttttggaate tactgegage acageaggte ageaacaagt ttattttgea	60					
gotagoaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg	120					
ttgattggtt tgtctttatg ggggcggggt ggggtagggg aaacgaagca aataacatgg	180					
agtgggtgea cectecetgt agazertggt tacaaagett ggggcagtte acetggtetg	24 D					
tgaccgtcat titcitgaca tcaatgitat tagaagicag gatatettit agagagicca	300					
cbgttctgga gggagattag ggtttcttgc caaatccaac aaaatccact gaaaaagttg	360					
gatgatcagt acgaetaccy aggestatte testatoget ggees	405					
-210: 100						
<210> 102 <211> 470						
<212> DNA						
<213> Komo sapien						
· · · · · · · · · · · · · · · · · · ·						
<400> 102						
tittitti titticitti tittititti tittititti tittititti tittit	60					
ggcacttaat coattettat ttoasaatgt otacaaattt aatoocatta taoggtattt	120					
toppaatcta aattattesa attagogaaa toottagoga atsatacoga aasatcaasa	180					
statactict ticagessac tigitacata astisaassa atatatacgg ciggigitit	24D					
Caaagtacaa ttatcttaac actgcaaaca ttttaaggaa ctaaaataaa aaaaaacact	30D					
cogcasaggt taaagggaac aacaaattot titacaacad dattataaaa atcatatoto aaatottagg ggaatatata diidacacogg gatoitaaci titacidaci tigiilaiii	360 420					
tttteeacca ttgtttgggc ccaacacaat ggaatccccc ctggactagt	470					
3333	110					
<210> 103						
<211> 501						
C212> DWA						
<213> Homo mapien						
<400> 103	•					
ttttttttt ttttttga coccetett ataaaaaaca agttaceatt ttattttact	60					
tacacatatt tattttataa ttggtattag atattcaaaa ggcagctttt aaaatcaaac	120					
tazatggaza etgeettaga tacataatte ttaggaztta gettazaate tgeetzaagt	180					
gammatette tetagetett tigmetgtam attittgmet ettgimmam micrammite	240					
attititite tetteasset taletaatet tieestilt teestatte asgicastit	300					
gettetetag ecteatitee tagetettat etactattag taagtggett titteetaaa	3&D					
agggaagaca ggaagagaaa tggcacacaa aacaaacatt ttatattcat atttctacct	42D					
acyttaataa aatagcattt tytyaagcca yetcaaaaga aggettagat eettttatyt	480					
ccattttagt cactaaacga tatcaaagtg ccagaatgca aaaggtttgt gaacatttat	540					
toazaagota atataagata tttoacatao toatotttot g	581					
<210> 104						
5.3 cm						

```
<40D> 104
tittettett tittittt tittitetett ettittitti gaaatgagga tegagtettt
                                                                        60
cactototag atagggcatg sagsassoto stotttorsg otttassata scastossat
                                                                       120
ctottatget atateatatt ttaagttaaa ctaatgagte actggettat etteteetga
                                                                       100
aggeaetçig itcaticito icaticatat agitatatca agiaciacoi igcatatiga
                                                                       240
gaggtttttc ttctctattt acacatatat ttccatgtga atttgtatca aacctttatt
                                                                       300
ttcatgcaaa ctagaaaata atgtttcttt tgcataagag aagagaacaa tatagcatta
                                                                       360
casaactgot casattgttt gttasgttat ccattataat tagttggcag gagotaatac
                                                                       420
asstracett tergeragra atseteeser tgesgterre gttasetetr casesteatt
                                                                       480
assggascat tittagcctg ggtataatta gctaattcac titacaagca titattagas
                                                                       540
tgaattcaca tgttattatt cctagcccaa cacaatgg
                                                                       578
      <210> 105
      <211> 538
      <212> DNA
      <213> Homo sapien
      <400> 105
ttttttttt tttttagta ataatcagaa caatattat ttttatattt saaattcata
                                                                        60
gazzagtgcc ttacatttaa tazaagtttg tttctcazag tgatcagagg zattagatat
                                                                       12D
gtottgaaca ocaatattaa tttgaggaaa atacaccaaa atacattaag taaattattt
                                                                       180
aagatdatag agobtgbaag tgaaaagaba aaattbgaoo toagaaacto tgagcabbaa
                                                                       240
ammiccacta traggamenta amtractary gactrictics transfiring tymicantar
                                                                       300
ggggtgbcac tggtaaacca acacattotg aaggatacat tacttagtga tagattotta :
                                                                       360
tgtactttgc taatacgtgg atatgagttg acaagtttct ctttcttcaa tcttttaagg
                                                                       420
ggcgagaaat gaggaagaaa agaaaaggat tacgcatact gttctttcta tggaaggatt
                                                                       480
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                                                                       538
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		cagatgggga				720
		aaggacttgg				76D
gagcatggat	gattggccag	aaatgaagaa	gaagtttgca	gatgtatttg	caaagaagac	84 D
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		tatgcatgga				1260
		attacagact				1320
		ttgetttata				1380
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<213 > Homo sapien

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Gly Thr Asp Ala Cys Val Thr Pro Val Leu Thr Phe Glu Glu Val Val
His his Asp his Asn Lys Glu Arg Gly Ser Phe Ils Thr Ser Glu Glu
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Gla Asp Val Ser Pro Arg Pro Ala Pro Leu Leu Leu Asa Thr Pro Ala
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Ile Pro Ser Phe Lys Arg Asp Pro Phe Ile Gly Glu His Thr Glu Glu
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Ile Leu Glu Glu Phe Gly Phe Ber Arg Glu Glu Ile Tyr Gln Leu Asn
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<212> PRT

<400> 112

<213> Homo sapien

165

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Ala Pro Pro Phe Ile Val Ile Ser His Leu Arg Leu Leu Leu Arg Glo 180 185 190 Leu Cys Arg Arg Pro Arg Ser Pro Glo Pro Ser Ser Pro Ala Leu Glu

170

175

195 200 His Phe Arg Val Tyr Leu Ser Lys Glu Ala Glu Arg Lys Leu Leu Thr 215 220 Trp Glu Ser Val His Lys Glu Asn Phe Leu Leu Ala Arg Ala Arg Aep 235 Lys Arg Glu Ser Asp Ser Glu Arg Leu Lys Arg Thr Ser Gln Lyc Val 250 Asp Leu Ala Leu Lys Gln Leu Gly His Ile Arg Glu Tyr Glu Gln Arg 265 Leu Lys Val Leu Glu Arg Glu Val Gln Gln Cys Ser Arg Val Leu Gly 28¢ 285 Top Val Ala Glu Ala Lou Sor Arg Ser Ala Leu Leu Pro Pro Gly Gly 295 Pro Pro Pro Pro Asp Leu Pro Gly Ser Lys Asp

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28 D

275

Thr Lau Phe Tyr Thr Asp Phe Val Gly Glu Gly Leu Tyr Gln Gly Val 295 Pro Arg Ala Glu Pro Gly Thr Glu Ala Arg Arg His Tyr Asp Glu Gly 310 Val Arg Met Gly Ser Leu Gly Leu Phe Leu Gin Cys Ala Ile Ser Leu 325 33D val Phe Ser Leu Val Met Asp Arg Leu Val Gln Arg Phe Gly Thr Arg 345 Ala Val Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala 360 Thr Cys Leu Ser His Ser Val Ala Val Val Thr Ala Ser Ala Ala Leu. 380 375 Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr Leu Ala 395 390 Ser Leu Tyr His Arg Glu Lyo Gln Val Phe Leu Pro Lys Tyr Arg Gly 410 4 D 5 Asp Thr Gly Gly Ala Ser Ser Glu Asp Ser Leu Met Thr Ser Phe Leu 420 425 Pro Gly Pro Lys Pro Gly Ala Pro Phe Pro Asn Gly His Val Gly Ala 440 435 Gly Gly Ser Gly Leu Leu Pro Pro Pro Pro Ala Leu Cys Gly Ala Ser 46 D 455 Ala Cys Asp Val for Val Arg Val Val Val Gly Glu Pro The Glu Ala 475 470 Arg Val Val Pro Gly Arg Gly Ile Cys Leu Asp Leu Ala Ile Leu Asp 490 Ser Ala Phe Leu Leu Ser Gln Val Ala Pro Ser Leu Phe Met Gly Ser 505 fle val Gin Leu Ser Gin Ser Val Thr Ala Tyr Met Val Ser Ala Ala 520 Gly Leu Gly Leu Val Ala Ile Tyr Phe Ala Thr Gln Val Val Phe Asp 535 Lys Ser Asp Leu Ala Lys Tyr Ser Ala

<210> 114 <211> 241 <212> PRT

<213> Homo sapien

<400> 114

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13D
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Lys Gly Leu Lys Cys Cys Gly Phe Thr Asn Tyr Thr Asp Phe Glu Asp
                     1,50
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Ser Pro Tyr Phe Lys Glu Asn Ser Ala Phe Pro Pro Phe Cys Cys Asn
                                      170
Asp Asn Val Thr Asn Thr Ala Asn Glu Thr Cys Thr Lys Gln Lys Ala
                                  195
His Asp Glo Lys Val Glu Gly Cyc Phe Asn Glo Leu Leu Tyr Asp Ile
Arg Thr Asn Ala Val Thr Val Gly Gly Val Ala Ala Gly Ile Gly Gly
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Gln
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                                                                        180
ackggtagaa aaacatctga agagctagtc tatcagcatc tgacaggtga attggatggt
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tetragaace attteaceea gacageetgt ttetateetg tttaataaat tagtttgggt
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ttagec
                                                                        366
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gagaaatgag atnaaacaca atnttataaa gtotacttag agaagatcaa gtgacotcaa
                                                                        120
agactitact attiticatat titleagacer atgatitate clattitagt eacciggite
                                                                        180
atacgttaaa caaaggataa tgtgaacagc agagaggatt tgttggcaga aaatctatgt
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                                                                        120
aataaggcaa aatatatgaa acaacaggto togagatatt ggaaatcagt caatgaagga
                                                                        180
                                                                        240
tactgatece tgateactgt ectaatgeag gatgtgggaa acagatgagg teacetetgt
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                                                                        305
tgggt
      <210> 118
      <211> 71
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      <213> Homo aapien
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      <221> misc_feature
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      <223 n = A,T,C or G
      <400> 118
                                                                         60
accasents interaction parategoga tototeatto coecacasto teagtegoaa
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aanteetggg t
      <210> 119
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      <211> 90
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ctccgccggc gcagaacatg ctggggtggt
      <210> 121
      <211> 218
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature -
```

```
<222> {1} ... {218}
       <223> n = A,T,C or G
       <400> 121
 tgtancgtga anacgacaga nagggttgtc aaaaatggag aanccttgaa gtcattttga
                                                                          6D
 gaataagatt tgctaaaaga tttggggcta aaacatggtt attgggagac atttctgaag
                                                                         120
 ataincangt aaattangga atgaatteat ggitettitg ggaatteett taegaingee
                                                                         180
 agcatanact testgigggg stancagets eccitgis
                                                                         218
       <210> 122
       <211> 171
       <212> DNA
       <213> Homo sapien
       <400> 122
 taggggbgta tgcaactgta aggacaaaaa ttgagactca actggcttaa ccaataaagg
                                                                          бQ
 cattightag cleatggase aggasgings atgginggge atothraging objeatingt
                                                                         120
 caccacceeg geggggtest etgtgecaca ggteertgtt gaeagtgegg t
                                                                         171
       <210> 123
       <2115 76
       <212> DNA
       <213> Homo mapien
       <220×
       <221> misc_feature
       <222> {1}...(76)
       <223> \pi = A,T,C or G
       <400> 123
tytagogtga agacnacaga atggtytyty otytyctato caggaacaca tttattatca
                                                                         60
ttatcaanta ttgtgt
                                                                         76 .
       <210> 124
       <211> 131
      <212> DNA
      <213> Homo sapien
      <400> 124
acctttcccc saggeceatg tectgtgtgc taactggccg gctgcaggac agctgcaatt
                                                                         6.0
caatgigcig ggicataigg aggggaggag actotaaxai agccaattit attototigg
                                                                        120
ttaagatttg t
                                                                        131
      c210> 125
      <211> 432
      <212> DNA
      <213> Homo mapien
      <400> 125
actitatica itggitatga aatagatggi ggaaaattgi gttaccaact ataccactgg
                                                                        60
cttgaasaag aggtgatagc tcttcagagg acttgtgact tttgctcaga tgctgaagaa
                                                                        120
ctacagtctg catttggcag aaatgamgat gaatttggat taaatgagga tgctgmagat
                                                                        180
ttgcctcacc asscassagt gasaccastg agagassatt ttcaggasas sagacagtgg
                                                                        24 D
ctcttgaagt atcagtcact tttgagaatg tttcttagtt actgcatact tcatggatcc
                                                                        30D
catggtgggg gtcttgcatc tgtaagaatg gaattgattt tgcttttgca agaatctcag
                                                                       360
caggaaacat cagaaccact attitclago colotgicag agcaaaccic agtgoctolo
                                                                       420
ctetttgett gt .
                                                                       432
```

```
<210> 126
      <211> 112
      <212> DNA
      <213> Homo sapien
      <4DG> 126
acacaactty sataptamaa tagamactga getgmaattt etamttemet ttetameent
                                                                           60
agtaagaatg atattteee eeagggatea ceaastattt staasaattt gt
                                                                          112
      <210> 127
      <211> 54
      <212> DNA
      <213> Homo sapien
      <400> 127
accacqaaac cacaaacaaq atggaagcat caatocactt gccaagcaca gcag
                                                                          54
      c210> 129
      c211> 323
      <212> DNA
      <213> Homo sapien .
      <400> 128
                                                                          БΦ
accteating that together gregothest the tetretan togethese the congress
acotgagata acagaatgaa aatggaagga cagccagatt teteetttee tetetgetea
                                                                         120
ttctctctga agtctaggtt acccattttg gggacccatt ataggcaata aacacagttc
                                                                         180
ccaaagcatt tggacagttt cttgttgtgt tttagaatgg ttttcctttt tcttagcctt
                                                                         240
tteetgeaaa aggeteaete agteeettge ttgctcagtg gactgggctc cecagggcct
                                                                         300
aggetgeett etttteeatg tee
                                                                         323
      <210> 129
      <211> 192
      <212> DNA
      <213> Homo sapien
      <220≥
      <221> misc feature
      <222> (1)...(192)
      <223> \pi = A, T, C \text{ or } G
      <4D0> 129
acatacatgt gtgtatattt ttaaatatca cttttgtatc actctgactt tttagcatac
                                                                          БÔ
tgaasacaca ctazcatast tintgigaac catgaicaga iacaacccaa aicaitcaic
                                                                         120
                                                                         180
tageacatte atetetgata naaagatagg tgagtttest tteetteseg tiggeesatg
gataaacaaa gt
                                                                         192
      <210> 130
      <211> 362
      c2125 DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1)...(362)
      \langle 223 \rangle n = A,T,C or G
                                                                          бQ
contituta iggaatgagi agactgtatg titgaanatt tanccacaac cictitgaca
```

```
tatmatgacg caacaaaaag gtgctgttta gtcctatggt teagtttatg cccctgacaa
                                                                        120
 gtttecattg tgttttgeeg atettetgge taategtggt atectecatg ttattagtaa
                                                                        180
 ttotytatto cattitytta acycobyyta gatytaacct getangagyd taactitata
                                                                        240
 ctatttaaa agotottatt ttgtggtoat taaaatggoa atttatgtgo agoeotttat
                                                                        300
 tgcagcagga agcacgtgtg ggttggttgt asagctcttt gctaatctta aasaqtaatg
                                                                        360
                                                                        362
       <210> 131
       <211> 332
       <212> DNA
       <213> Komo sapien
      <220>
      <221> misc feature
      <222> (1)...(332)
      <223> n = A,T,C or G
       <400> 131
ctttttgaaa gatcgtgtcc actcctgtgg acatcttgtt ttaatggagt ttcccatgca
                                                                         60
gtangactgg tatggttgca gctgtccaga taaaaacatt tgaagagctc caaaatgaga
                                                                        120
gtteteecag gttegeeetg etgeteeaag teteageage ageetetttt aggaggeate
                                                                        180
ttotgaacta gattaaggoa gottgtaaat otgatgtgat ttggtttatt atocaactaa
                                                                        240
cttccatctg ttatcactgg agaaageees gacteecean gacnggtacg gattgtggge
                                                                        300
atamaaggat tgggtgaagc tggcgttgtg gt
                                                                        332 .
      <210> 132
      <211> 322
      <212> DMA
      <213> Homo tapien
      <220>
      <221> misc_feature
      <222> (1) ... (322)
      <223> D = A,T,C or G
      <400> 132
actitigeca titigiatat ataascasic tigggacati ciccigassa ciaggigico
                                                                        60
agtggptaag agaactegat tteaageaat tetgaaagga aaaccageat gacacagaat
                                                                       12D
ctcaeattcc caaecagggg ctctgtggge aaeetgaggg aggecctttg tetctcgggt
                                                                       180
tttagcaagt taaaatgaan atgacaggaa aggettattt atcaacaaag agaagagttg
                                                                       240
ggatgcttct assassact ttggtagsga ssataggast gctnastcct agggsagcct
                                                                       30D
gtaacaatot acaattqqtc ca
                                                                       322
      <210> 133
      <211> 278
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(278)
      <223> n + A, T, C or G
      <400> 133
acaagcotto acaagtitaa otaaattggg attaatotti otgtanttat otgoataatt
                                                                        60
ettgttttte tttecatetg getectgeet tgacaatttg tggaaacaac tetattgeta
                                                                       120
ctatttaaaa aaaatcacas atctttccct ttaagctatg ttqaattcaa actattcctg
                                                                       180
ctattcctgt titgtcaeag azattatatt titcsessets tgtntatttg titgatgggt
                                                                       24 D
```

```
cccargasse setaataaaa accacagaga ccagootg
                                                                         278
      <210> 134
      <211> 121
       <212> DNA
      <213> Homo sapiso
      <220>
      <221> misc_feature
      <222> (1) ... (121)
      \langle 223 \rangle n = A.T.C or G
      <400> 134
ptttenaaaa cttgtttage teestagagg aaagaatgtt aaactttgta teetaaaaca
                                                                          60
tgattetetg aggitasact tggtttteas atgitatitt tactigtatt tigcittigg
                                                                         120
                                                                         121
      <210> 135
      <211> 350
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... {350}
      <223> n = A,T,C or G
      <400> 135
acttanaacc atgectagea eateagaate ceteaaagaa cateagtata ateetataee
                                                                         БŰ
Rtancaagtg gigaciggit aagogigoga caaaggicag eiggcacati actigigige
                                                                        12D
asacttgata ettitgitet aagtaggaze tagtatacag tneetaggan tggtacteca
                                                                        180
gggtgccccc caactcctgc ageogetect ctgtgccagn contgnaagg aacttteget
                                                                        240
ecareteast caagecetyg gecatyetse etycaattyy etysacaaac ytttyctysg
                                                                        300
tteccaagga tgcaaageet ggtgeteaac teetgggggg teaacteagt
                                                                        350
      <210> 136
      <211> 399
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(399)
      <223> n = A,T,C or G
      <400> 136
tgtaccgtga agacgacaga agttgcatgg cagggacagg gcaggggccga ggccaggggtt
                                                                         60
gotstgattg tatcogaata ntoctogtga gaaaagataa tgagatgaog tgagoagoot
                                                                        130
geagaettgt gtetgeette aankageeag zeaggaagge eetgeetgee ttggetetga
                                                                        180
cotspossor ascoascoas cracassing sottettoct titstasta caacnecaas
                                                                        240
aaasctgcag aggcccaggg tcaggtgtna gtgggtangt gaccataaaa caccaggtgc
                                                                        300
toppaggaac cogggraaag goratoroca cotacagora gratgeceac toggegtgatg
                                                                        360
ggtgcagang gatgaagcag ccagntgttc tgctgtggt
                                                                        399
      <210> 137
      <211> 165
      <212> DNA
      <213> Homo sapien
```

```
<220>
      <221> misc_feature
      <222> (1)...(165)
      \langle 223 \rangle n = A,T,C or G
      <400> 137
actggtgtgg tngggggtga tgctggtggt anaagttgan gtgacttcan gatggtgtgt
                                                                          50
ggaggaagtg tgtgaacgta gggatgtaga ngtttttggcc gtgctaaatg agcttcggga
                                                                         120
ttggctggtc ceactggtgg tcactgtcat tggtggggtt cctgt
                                                                         165
      <210> 138
      <211> 338
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> {1]...(338)
      <223> \pi = A, T, C \Leftrightarrow G
      <400> 138
acteactgga atgecacatt cacaacagaa teagaggtet gtgaaaacat täätggetee
                                                                          60
ttaacttote captaagaat cagggacttg aaatggaaac gttaacagee acatgcccaa
                                                                         120
tgetgggrag teteceatge ettecacagt gaaagggett gagaaaaate acatecaatg
                                                                         1 B O
tcatgtgttt ccagccacac caaaaggtgc ttggggtgga gggctggggg catananggt
                                                                         240
cangecteag gaageeteaa gtteeaftea gettfgccae tgtacattee ecatntttaa
                                                                         300
papaactgat gccttttttt tttttttttg tassattc
                                                                         338
      <210> 139
      <211> 382
      <212> DNA
      <213> Homo sapien
      <400> 139
gggaatettg gtttttggea tetggtttge etatageega ggeeaetttg acagaacaaa
                                                                          бQ
gaaayygact togagtaaga aggtgattta cagocagoot agtgccogaa gtgaaggaga
                                                                         120
attraaacag acctegtest teetggtgtg agentggteg geteseegen tatestetge
                                                                        180
attigectia cleaggiget accggactet ggeceetgat gietgiagit teacaggaig
                                                                        240
                                                                        300
containing officeacc ccacagggco containing toggatgtgt tittaataat
gteagetatg tgececated tectteatge ectecetede titteetacea etgetgagtg
                                                                        360
geetggaact tgtttaaagt gt
                                                                        382
      <210> 140
      <211> 200
      <212> DNA
      <213> Homo sapien
      c220>
      <221> misc feature
      <222> (1)...(200)
      <223> n = A, T, C or G
      <400> 140
accasancti citiciquig igtingatit tactataggg gittingcitn tictasanat
                                                                         60
Actiticati taacanciit tgitaagtgi caggotgcac titgotocat anaattatig
                                                                        120
                                                                        180
ttttcacatt tcascttgta tgtgtttgtc tcttanagca ttggtgaaat cacatatttt
atattcagca taaaggagee
                                                                        200
```

```
<210> 141
      <211> 335
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(335)
      <223> n = A,T,C or 0
      <400> 141
actitatiti caasacacto ataigtigoa assaacacai agaasaataa agittiggigg
                                                                         60
gggtgctgac taaacttcaa gtcacagact tttatgtgac agattggagc agggtttgtt
                                                                        120
atgoatgtag agaacccaaa ctaatttatt aaacaggata gaaacagget gtetgggtga
                                                                        180
aatggttotg agaaccatco aattoaccig toagatgctg atamactago bobbosatg
                                                                        240
ttittctacc agticagaga inggitaaig actaniicca aiggggaaaa agcaaqaiqq
                                                                        300
attcacaaac caaqtaattt taaacaaaqa cactt
                                                                        335
      <210> 142
      <211> 459
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(459)
      <223> n = A,T,C or G
      <400> 142
accaggitaa tattgeesea tatateetti ecaattgegg getaaacaga egigiattia
                                                                        60.
gggttgttta aagacaaccc agcttaatat caagagaaat tgtgaccttt catggagtat
                                                                       120
objatgaga aaacaobjag tottgacaaa tobtatbtta ttoagatago agtobgatoa
                                                                       160
cacatggtoc accascacto aastastaas tossatatna tragatgtta asgattggto.
                                                                       240
ttcasacate atagecastg atgecceget tgestataat eteteegaea taaaaceaea
                                                                       3 D D
transacto astssecate anacoattem searcastte ettametsts asetstttsa
                                                                       360
agetaceast etsaseacta ttsactaint titteanget etsaataset etasssatet
                                                                       420
cagcangggt gggaggaard agricaarct tggrgtant
                                                                       459
      <210> 143
      <211> 140
      <212> DNA
     <213> Homo sapien
acatiteett ceaceaagte aggacteetg gettetgtgg gagttettat cacetgaggg
                                                                        60
zaatccaaac agtotototot agaaaggaat agtgtcacca accccaccca totccctgag
                                                                       120
accetcoger ttroctgtgt
                                                                       140
     <210> 144
     <211> 164
     <212> DNA
     <213> Homo sapien
     <220>
     <221> misc feature
     <222> (1)...(164)
     <223> \pi = A,T,C or G
```

```
<400> 144
acticagine caecatacaa taacaacati aagigtatat igccatciii qicattiici
                                                                         60
atctatacca etctccette tgaaaacaan aatcactane caatcactta tacaaatttq
                                                                        120
aggicalitae tocatality tittosetsa ggsssssssag algi-
                                                                        164
       <210> 145
      <211> 303
       <212> DNA
       <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(303)
      <223> n = A, T, C or G
      <400> 145
acgbasecca toceactity tatitgteat ggoatecate cagnagosat toctaeacat
                                                                         60
actggagggt atttataccc aattatccca tteattaaca tgccctcctc etcaggctat
                                                                        130
graggacage tatestaagt eggeeragge ateragatae taeratttgt ataaacttea
                                                                        180
gtaggggagt ccatccaagt gacaggteta atcaaaggag gaaatggaac ataaqcccaq
                                                                        240
tagtaaaatn togottagot gaaacagoca caaaagactt accqccqtqq tqattaccat
                                                                        3 D G
CRA
                                                                        303
      <210> 146
      <211> 327
      <212> DNA
      <213> Homo sapien
      <22Q>
      <221> misc_feature
      <222> {1}...(327)
      <223> n = A, T, C or G
      <400> 146
actgoagete aattagaagt ggtetetgae titeatcane tictcoctgg getecatgae
                                                                         60
actggootgg agtgactoat tgotofggtt ggtfgagaga gotootttgo caacaggoot
                                                                        120
ccaaglcagg grigggatti gittcrittr carattriag raaraataig riggreactt
                                                                        180
cctgaacagg gagggtggga ggagccagca tggaacaagc tgccactttc taaagtagcc
                                                                        240
agacttgccc ctgggcctgt cacacctact gatgacettc tgtgcctgca ggatggaatg
                                                                        300
taggggtgag ctgtgtgact ctatggt
                                                                        327
      <210> 147
      <211> 173
      <212> DNA
      <213> Homo papier
      <220≻
      <221> misc feature
      <222> (1)...(173)
      <223 > n = A,T,C or G
      <400> 147
acattgtttt tttgagataa agcattgana gagctctcct taacgtgaca caatggaagg
                                                                        60
ActggaBcac Stacccacat ctttgttctg agggataatt ttctgatasa gtcttgctgt
                                                                       120
atattcaago acatatgita tatattatto agittcoatgi tiatagoota git
                                                                       173
      <210> 148
```

```
<211> 477
      <212 > DNA
      <213 > Homo sapien
      <220>
      <221> misc feature
      <2225 [1]...(477]
      <223> n = A,T,C or G
      <400> 148
acaaccactt tateteateg aattettaae eeaaacteae teactgtgee titetateet
                                                                         60
Atgggatata ttatttgatg ctccatttca tcacacatat atgaataata cactcatact
                                                                        130
geoctactae etgetgeaat aateacatte cetteetgte etgaccetga ageoattggg
                                                                        180
gtggteetag tggccateag tecangeetg caecttgage cettgagete cattgeteac
                                                                        240
nocancecae cteaccaece ecatectett acacagetae etecttgete tetaacceca
                                                                        300
tagattatnt ccasattcag tcsattaagt tactattaac actotaccog acatgtccag
                                                                        36D
caccactggt aageottoto cagocaacao acacapacao acacneacao acacapatat
                                                                        42D
ccaggeacag getaceteat etteacaate acceetitaa ttaccatget atggtgg
                                                                        477
      <210> 149
      <211> 207
      <212> DNA
      <213> Homo sepien
      <400> 149
acaptipiat tataatatea agaaataaan tigcaatgag agcatttaag agggaagaac
                                                                         60
taacgtattt tagagagcca aggaaggttt rigitggggag igggaigtaa ggiggggcii
                                                                        120
gatgateaat aagagtcagc caggtaagtg ggtggtgtgg tatgggcaca gtgaagaaca
                                                                        180
threaggeag agggazeage agtgasa
                                                                        207
      <210> 150
      <211> 111
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> [1]...(111)
      \langle 223 \rangle n = A,T,C or G
      <400> 150
accttgattt cattgctgct ctgatggaaa cccaactatc taatttagct aaaacatggg
                                                                         60
cacttaastg tggtcagtgt ttggacttgt taactantgg catctttggg t
                                                                        111
      <210> 151
      <212> 196
      c212> DNA
      <213> Homo sapien
      <400> 151
agegeggeag gteatattga acattecaga tacctateat tactegatge tgttgataac
                                                                         60
                                                                        120
ageaagatgg ctttgaactd agggteacea deagetattg gacettacta tgaaaaccat
ggataccaac cogaaaacce ctatecegea cageecactg togteeceac togtetacgag
                                                                        180
                                                                        196
gtgcatccgg ctcagt
      <210> 152
      <211> 132
      <212> DNA
```

```
<213> Homo sapien
       <4QD> 152
 acageaetti cacatgibag aagggagaaa tiectaaatg taggagaaag ataacagaac
                                                                          60
 cttccccttt tcatctagtg gtggaaacct gatgctttat gttgacagga atagaaccag
                                                                         120
gagggagttt gt
                                                                         133
       <210> 153
       <211> 205
       <212> DNA
       <213> Homo sapien
       <220>
      <221> misc_feature
       <222> (1)...(205)
      <223> n = A,T,C or G
      <4D0> 153
acaanaccca nganaggeea etggeegtgg tgteatggee tecaaacatg aaagtgteag
                                                                         50
ettetgetet tatgteetea tetgacaact etttaccatt titateeteg etcageagga
                                                                         120
geneateant annyteens gtettggnet tggeettgge ttggnggnng tentennes
                                                                         18D
cetygetagt gagggtgogg egeogeteet ggatgaegge atetgtgaag togtgeacea
                                                                         24 D
stotgoaggo cotgtggaag cgccgtccac acggagtnag gaatt
                                                                         285
      <210> 154
      <211> 333
      <212> DNA
      <213> Romo sapien
      c400> 154
accacagtee tgttgggeea gggetteatg accetteetg tgaamageea tettateace
                                                                         60
accocaaatt Ettoottaaa tatotttaac tgaaqqqqto aqootottqa otqoaaaqac
                                                                        120
cotaageogg ttacacaget aacteceact ggecetgatt tgtgaaattg ctgetgeetg
                                                                        180
attggcacag gagtegaagg tgttcagete cectecteeg tggaacgaga etetgatttg
                                                                        240
agtiticacaa attologggo cacciogtos tigotoctot gasatasaat coggagastg
                                                                        3 D O
gtcaggcctg totcatocat atggatotto ogg
                                                                        333
      c210> 155
      <211> 308
      <212> DNA
      <213> Homo sapien
      <220×
      <221> miec_feature
      <222> {1}...(308)
      \langle 223 \rangle \pi = A, T, C \text{ or } G
      <400> 155
actggmmata atammaccca catcmcagtg ttgtgtcaam gatcmtcagg gcmtggmtgg
                                                                         60
gaaagtgctt tgggaactgt aaagtgccta acacatgatc gatgattttt gttataatat
                                                                        120
togratored gigeratacia actolocide officiale iggeocoas coccagooco
                                                                        180
atcacagete actgetetgt teatecagge ceageatgta gtggetgatt ettettgget
                                                                        240
gettttagee tecanaagtt tetetgaage caaccaaace tetangtgta aggeatgetg
                                                                        300
gccctggt
                                                                        308
      <210> 156
```

<211> 295 <212> DNA

480

<213> Homo sapien <400> 156 accttgctcg gtgcttggam catallegga actcaammta tgagatgata acmgtgcctm ٤D thatigatha digagagaac igitagacat thagitgaag attitotaca caggaaciga 12D gaataggaga ttatgtttgg cootoatatt etotoctate etecttgeet cattetatgt 180 ctaatatatt ctcaatcaaa taaggttagc ataatcagga aatcgaccaa ataccaatat 240 adaaccagat gtotatoott aagattttoa aatagaaaac aaattaacag actat 295 <210> 157 <211> 126 <212> DNA <213> Homo sapien <4D0> 157 acaagtttaa atagtgotgt cactgtgoat gtgotgaaat gtgaaatcoa coacatttot 60 gaagagcaaa acaaattotg toatgtaato totatottgg gtogtgggta tatotgtoco 120 126 <210> 158 <211> 442 c212> DNA <213> Homo sapien <220× <221> misc feature <222> {1}...(442) <223> n = A,T,C or G <400> 158 accoactogi citygaaaca cocatcotta atacgatgat tittetgicg tgigaaaatg 60 aancrageag getgeeecta gteagteett eetteeagag aaaaagagat ttgagaaagt 120 gcctgggtaa ttcaccatta atttcctccc ccaaactotc tgagtcttcc cttaatatt 180 ctggtggttc tgaccaaagc aggtcatggt ttgttgagca tttggggatcc cagtgaagta · 240 natotitota geetteesta ettageeett eeeaegeaca aacogagtee eagagtogte 300 cceaccctgt tttcccagtc cacqtageca gattcacagt gcggeattct ggaagctgga 360 nacagaeggg etettigeag agregggaet etgagangga eatgagggee tetgeetetg 920 tgttcattct ctgatgtcct gt 442 <210> 159 <211> 498 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> {1}...(49B} <223> n = A,T,C or G<400> 159 acticcaggi aacgitgitg titiccgitga gootgaacig atgggtgacg tigtaggitc 60 tecaacaaga actgaggttg cagagegggt agggaagagt getgttecag ttgcacetgg 120 gctgctgtgg actgttgttg attcctcact acggcccaag gttgtggaac tggcanaaag 180 gtgtgttgtt gganttgage tegggegget gtggtaggtt gtgggetett caacagggge 240 tgctgtggtg ccgggangtg eengtgttgt gtcacttgag cttggccagc tctggaaagt 300 antanattet teetgaagge cagegettgt ggagetggea ngggteantg ttgtgtgtaa 360 cgaaccagtg ctgctgtggg tgggtgtana tcctccacaa agcctgaagt tatggtgtcn 42D

traggtaana atgtggtttr agtgtroctg ggrngctgtg gaaggttgta nattgtracc

DEEDOOID JAIO 0104000A0TI .

```
498
aagggaataa getgtggt
      <210> 160
      <211> 380
       <212> DNA
      <213> Homo sapien
      <220>
      <221> misc teature
      <222> [1]...(380)
      <223> n = A, T, C or G
      <400> 160
acctgoater agetteertg resacticae asggsgaest caaretrisg scagggsaar
                                                                         60
agetteagga tacttecagg agacagagee accageagea aaacaaatat teecatgeet
                                                                        120
ggagcatggc atagaggaag otganaaatg tggggtotga ggaagccatt tgagtotggc
                                                                        180
cactagacat etcatcagee acttgtgtga agagatgeee catgaceeca gatgeetete
                                                                        240
craccettae etecatetea cacacttgag etttecaete tgtataatte taacateetg
                                                                        300
gagaaaaatg geagttigae egaacetgit cacaacggta gaggetgatt tetaacgaaa
                                                                        360
cttgtagaat gaagcctgga
                                                                        3BQ
      c210> 161
      <211> ·114
      <212> DNA
      <213> Homo @apien
      <400> -161
actecacate coetetgage aggeggttgt egitteaaggt giattiggee tigeotigtea
                                                                         60
cactgiccae tggcccctta tccactiggt gcttaatccc tcgaaagagc aigi
                                                                        114
      <210> 162
      <211> 177
      <212> DNA
      <213 > Homo sapien
      <400> 162
actticigaa togaatcaaa igalacttag iglagittia alatooboat alatatoaaa
                                                                        60
gttttactac tetgataatt tigtaaacca ggiaaccaga acatecagic atacagefit
                                                                        120
typtgatata taacttggca ataacccagt ctggtgatac ataaaactac tcactgt
                                                                        177
      <210> 163
      <211> 137
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc_feature
      <222> (1)...(137)
      <223> n - A.T.C or G
      <400> 163
catttataca gacaggcgtg aagacattca cgacaaaaac gcgasattct atcccgtgac
                                                                         60
canagaaggo agotaoggot actoctabat cotggogtgg gtggcottog cotgoacott
                                                                       120
catcagoggc atgatgt
                                                                       137
      <210> 164
      <211> 469
      <212> DNA
```

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<213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(469)
       c223 > n = A, T, C \text{ or } G
       <400> 164
ottaboacaa tgaatgitoi cotgggeago gttgtgatoi tigecaccit cgtgactita
                                                                          60
tycaatycat catyctattt catacctast gagggagttc caggagattc saccaggass
                                                                         120
tgcatggatc tcassggssa casacaccca ataaactogg agtggcagac tgacaactgt
                                                                         18D
gagacatgca cttqctacga aacagaaatt tcatqttqca cccttqtttc tacacctqtq
                                                                         24D
ggttatgaca aagacaactg ccaaagaatc ttcaagaagg aggactgcaa gtatatcgtg
                                                                         300
9tggagaaga aggacccaaa aaagacctgt tetgtcagtg aatggataat ctaatgtgct
                                                                         360
totagtaggo acaggetto caggocaggo cteattetee totggeetet matagicast
                                                                         420
gattgtgtag ccatgcctat cagtaaaaag atntttgagc aaacacttt
                                                                         469
      <210> 165
      <211> 195
      <212> DNA
      <213> Homo Bapien
      <22D>
      <221> misc feature
      <222> (1)...[195]
      <223> n = A, T, C \text{ or } G
      <400> 165
acagittitt atamatatog acattgoogg cacetgigtt cagittcata aagciggigg
                                                                         -60
atcogolyte atcoactatt cottygetag agtaaaaatt attoltatag cocatyteec
                                                                        120
tgcaggcogc cogcoogtag ttotogttoe aptogtottg gcacacaggg tgccaggact
                                                                        180
teetetgaga tgagt
                                                                        195
      <210> 166
      <211> 383
      <212> DNA
      <213> Homo capien
      <320>
      <221> misc_feature
      <222> (1)...(383)
      <223> n = A,T,C or G
      <400> 166
acatettast äststepeac atcagggggc catcagggtc acagtcactc atagcctcgc
                                                                         60
cyaggtegga gteracarea eeggtgtagg tgtgeteaat ettgggettg gegeeracet
                                                                        120
ttggagaagg gatatgetge acacatgt coacaaagee tgtgaacteg ccaaagaatt
                                                                        18D
tttgcagacc agcctgagca aggggcggat gttcagcttc agctcctcct tcgtcaggtg
                                                                        24D
gatgecasce tegtetangg teegtgggaa getggtgtee acnteaceta caacetggge
                                                                        30D
gangatetta tasagagget eenagataaa eteetaegaaa ettetetggg agetgetagt
                                                                        360
nggggccttt ttggtgaact ttc
                                                                        383
      <210> 167
      c211> 247
      <212> DNA
      <213> Homo sapien
      <220>
```

```
<221> misc feature
      <222> (1) ... (247)
      <223> n = A,T,C or G
      <400> 167
acegagecas accttggcca taaatgaanc agagattaag actmaacccc magtcgmnat
                                                                         6 D
tggagcagaa actggagcaa gaagtgggcc tggggctgaa gtagagacca aggccactgc
                                                                        120
tatanocata cacagageca acteteagge caaggenatg gtbggggcag anceagagae
                                                                        081
teaatetgan teeaaagtgg tggetggaae actggteatg zeanaggeag tgaetetgae
                                                                        240
tgangte
                                                                        247
      c210> 168
      <211> 273
      <212> DNA
      <213 > Homo mapien
      <220>
      <221> misc_feature
      <222> (1)...(273)
      <223> n = A,T,C or G
      <400> 168
acttetaagt tttetagaag tggaaggatt gtanfeatee tgaaaatggg tttactteaa
                                                                         60
aatecetean cettgttett cacnactgte tatactgana gtgteatgtt tecacaaagg
                                                                        12D -
getgacacet gageetgmat titeacteat coetgagaag coetttecag tagggtggge
                                                                        180
aattoccaac ttocttgcca caagettocc aggetttotc cootggaaaa ctocagettg
                                                                        240
agtoccagat acadteatgg getgedetgg gda
                                                                        273
      <210> 169
      <211> 431
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1)...[431}
      <223> ti + A,T,C or G
      <400> 169
acagocttgg ottococaaa otocacagto toagtgoaga aagatoatot tocagoagto
                                                                         60
agotcagacc agggtcaaag gatgtgacat caacagtttc tggtttcaga acaggttcta
                                                                        120
ctactgtcas atgaccocco atacttcctc assggctgtg gtasgttttg cacaggtgag
                                                                        180
ggcagcagas agggggtant tactgatgga caccatcttc tetgtatact ccacactgac
                                                                        240
cttgccatgg gcazaggccc ctaccacaza azcaatagga tcactgctgg gcaccagctc
                                                                        300
acgeacatea etgaeaaceg ggatggaaaa agaantgeca aettteatae atecaactgg
                                                                        360
azagigatot gataciggat tottaattac ottoaaaago tiotgggggo catragotgo
                                                                        420
trgaecactg a
                                                                        431 .
      <210> 170
      <211> 266
      <212> DNA
      <213 > Homo sapien
      <220×
      <221> misc feature
      <222> {1}...(266}
      \langle 223 \rangle n = A,T,C or G
```

```
c400> 170
accigigge igggefgita igeotgige ggetgetgaa agggagitea gaggiggage
                                                                         60
traaggaget etgraggeat tttgreaane eteteranag ranagggage aacetacaet
                                                                        120
cccogctaga aagaceccag attggagtcc tgggaggggg agttggggtg ggcatttgat
                                                                        180
gtatecttgt carrigaatg aangagorag agaggaanga gargaanatg anattggrot
                                                                        240
                                                                        265
tcaaagctag gggtctggca ggtgga
      <210> 171
      <211> 1248
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1), (1248)
      \langle 223 \rangle n = A,T,C or G
      <400> 171
ggragcraaa testaaargo cyapgaetge ageccycaet egcagceetg gcaggcggca
                                                                         60
ctggtcatgg assacgaatt gttctgctcg ggcgtcctgg tgcatcogca gtgggtgctg
                                                                        120
teageogeae actyttteea gaagtgagtg cagageteet acaccategg getgggeetg
                                                                        180
cacaştettş aşşecşacea aşaşecaşşş aşecaşatşş tggaşşecaş ectetecşta
                                                                        240
                                                                        300
eggeaceesg sgtacaseag accettgete getaacgace teatgeteat caagttggae
                                                                        36D
gaatcegtgt cogagtetga caccateegg agcateagea ttgettegea gtgccctace
                                                                        420
geggggaact cttgeetegt ttetggetgg ggtetgetgg egaacggcag aatgeetace
gtgctgcagt gcytgaacyt gtcygtggtg tctgaggagg tctgcagtaa gctctatgac
                                                                        480
cegrigiace acceesgeat giteigegee ggeggaggge aagaceagaa ggaeteeige
                                                                        54 D
asoggigact otggggggcc cotgatotec asogggtact tgcagggcot tgtgtottto
                                                                        БQD
ggaaaageed egtgtggdda agttggdgtg edaggtgtot acaddaacet dtgdaaatte
                                                                        660
actgagtgga tagagaaaac cgtccaggcc agttaactct ggggactggg aacccatgaa
                                                                        720
attgaccccc asatscatec tgoggasggs attcaggast stetgttecc sgecectect
                                                                        780
costcapyce caggayteca gyeccedage dectected towarchay gytadayate
                                                                        840
eccageceet cotoceteag acceaggagt coagacecee cageceetee tereteagae
                                                                        900
                                                                        960
ccaggagtee agreectest cestragace caggagtera gaccorccag eccetostee
ctcagaceca ggggtecagg cececaacec etectecete agactcagag gtecaagece
                                                                      1020
resaccente attecceaga eccagaggte caggiteceag eccetenter etragaceea
                                                                      1080
                                                                      1140
geggtecaat gecaectaga cintecetgt acaeagigee coetigigge aegitgaeee
                                                                      1200
ascettacea gitggittit cattitingt coetticece tagatecaga aataaagitt
аадыдаадпу санаанаана анканаламы накананалы алманана
                                                                      1248
      <210> 172
      <211> 159
      <212> PRT
      <213 > Homo sapien
      <220>
      <221> VARIANT
      <223> (1)...(159)
      <223> Xaa = Any Amino Acid
      <400> 172
Met Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro
                                    10
Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser
                                25
Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gin Cys Pro Thr
                            40
Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly
```

```
50
                        55
Arg Met Pro Thr Val Leu Gln Cys Val Agn Val Ser Val Val Ser Glu
                    70
                                        75
Glu Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe
                85
                                    90
Cys Ala Gly Gly Gln Xaa Gln Xaa Asp Ser Cyt Asn Gly Asp Ser
            100
                                105
Gly Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe
                            120
Gly Lys Ala Pro Cys Gly Gln Val Gly Val Pro Gly Val Tyr Thr Asn
                        135
                                            140
Leu Cys Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Glo Ala Ger
                    150
      <210> 173
```

<211> 1265 <212> DNA <213> Romo sapien

<220>
<221> misc\_feature
<222> (1)...(1265)

 $\langle 223 \rangle$  n = A,T,C or G

<400> 173

ggcagecege actegeagec etggcaggeg geactggtea tggaaaaoga attgttetge 6 D tegggegtee tggtgeatee geagtgggtg etgteageeg eacactgttt ceagaactee 120 tacaccatog ggotgggcct goacagtott gaggoogaee aagagooagg gagocagatg 180 gtggaggcca gcctctccgt acggcaccca gagtacaaca gacccttgct cgctaacgac 240 ctcatgctca tcaagttgga cgaatcogtg tcogagtctg acaccatcog gagcatcagc 300 attgettege agtgeretar egeggggase tettgerteg titetggetg gggtetgetg 360 gcgaacggtg agricacggg tgtgtgtctg ccctcttcaa ggaggtcctc tgcccagtcg 420 C99999ctga cocagagote tecttectag gragaatgee taccettectg caqteetta 480 acytytegyt gytytetgag gaggtetgea gtaageteta tgaeeegetg taccaeecea 540 gratgitetg rgcrggrgga gggcaagare agaaggaete etgesaeggt gactetgggg 600 ggcccctgat ctgcaacggg tacttgcagg gccttgtgtc tttcggaaaa gccccgtgtg 660 gccaagttgg ogtgccaggt gtctacacca acctctgcaa attcactgag tggatagaga 720 aaacogtoca ggocagttaa ctotggggac tgggaaccca tgaaattgac ccccaaatac 780 atcotgoga aggasttosg gastatotgt topcageone tecteories ggooraggag 840 tecaggeece cagecectee teceteaaac caagggtaca gatececage coetretece 900 teagacecag gagtecagae eccecagece etectecete agacecagga gtecagece 96 D tecteentea gacccaggag tecagaccc ccageccete eteceteaga eccaggggtt 102D gaggecoock accortoote etteagagte agaggteeaa gecoecaate octegttoee 1080 cagacccaga gginnaggio coagoccoto ticontoaga occagnggio caatgocaco 1140 tagattitics eignacaeag igosecetig iggnanging acceasett accagings 1200 ttttcatttt tngtcccttt cccctagatc cagaaataaa gtttaagaga ngngcaaaaa 1250 aaaaa 1265

<210> 174 <211> 1659 <212> DNA <213> Homo sapien <220> <221> misc\_feature <222> {1}...(1459)

 $\langle 223 \rangle$  n = A,T,C or G

1240

1167

```
<400> 174
ggbcagcogc acactgitte cagaagtgag tgcagagete ctacaccate gggetgegee
                                                                         6 D
tockcaptot tgasgoogac caagagocag ggagocagat gstggasgoo agceteteeg
                                                                        120
tacggcacce agastacaac asaccettse tesetaacsa ceteatsete ateaasttsg
                                                                        OBI
acquatecgt groupagtot gacaccated ggagdateag cattgottog cagtgocota
                                                                        240
cogoggggaa otottgccto gtttctggct ggggtctgct ggcgaacggt gagctcacgg
                                                                        300
gtgtgtgtot geeetettem mygmageteet etgeeemgte gegggggetg meeemmagmaget
                                                                        360
ctgcgtccce ggcagaatgc ctaccgtgct gcagtgcgtg aacgtgtcgg tggtgtctga
                                                                        420
ngaggtetge antmagetet atgacceget gtaccaccec ancatgttet gegeeggegg
                                                                        480
agggcaagac cagaaggact cctgcaacgt gagagagggg aaagggggagg gcaggcgact
                                                                        540
cealabaaraa falubaadaa aarayoogu seresaada codosfaca saufacadaa
                                                                        600.
atggagagac acacagggag acagtgacaa ctagagagag aaactgagag aaacegagaa
                                                                        660
ataascacag gaatsaagsg aagcaaagga agagagaaac agaaacagac atggggaggc
                                                                        720
agaaacacac acacatagaa atgcagttga cottocaaca gcatgggggc tgagggcggt
                                                                        780
gacotocaco caatagaaaa tootottata actittgact coccaaaaac etgactagaa
                                                                        840
atagectact gligacgggg agcettacea ataacataaa tagtegatti algeatacgt
                                                                        900
tttatgcatt catgatatac ctttgttgga attttttgat atttctaagc tacacagttc
                                                                        96 D
gtctgtgaat tittttaaat tgttgcaact ctcctaaaat ttttctgatg tgtttattga
                                                                       1020
aasaateesa gtataagtgg aettgtgeat teaaaeesgg gttgtteaag ggteaaetgt
                                                                       1080
gtaccoagag ggaaacagtg acacagatte atagaggtga aacacgaaga gaaacaggaa
                                                                       1140
asstesagse tetacsaags ggetgggeag ggtggeteat geetgtaate ceageaettt
                                                                       1200
gggaggcgag gcaggcagat cacttgaggt aaggagttca agaccagcct ggccaaaatg
                                                                       1260
gtgaaateet gtetgtaeta aaaatacaaa agtfagetgg atatggtgge aggegeetgt
                                                                       1320
aatoccaget acttgggagg etgaggeagg agaattgett gaatatggga ggeagaggtt
                                                                       1380
gaagigagit gagatcacac cactatacto cagotggggo aacagagtaa gactotgtot
                                                                      1440
Cataataata attaattaa
                                                                      1459
      <210> 175
      <211> 1167
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(1167)
      <223> n = A, T, C or G
      <400> 175
gegeagecet ggeaggegge actggteatg gaaaacgaat tgttetgete gggegteetg
                                                                        бD
gigcalcogo agigggigot gicagoogoa cacigitico agaacteeta caecatoggg
                                                                       120
cigggeoige acagiethga ggeogaceaa gageoaggga gccagaiggi ggaggeoage
                                                                       180
ctotoogtac ggcaccoaga gtacaacaga ctottgeteg ctaacgacct catgetcatc
                                                                       240
eagttggacg aatcogtgto cgagtotgac accatoogga goatcagoat tgottogoag
                                                                       300
tgccctaccg cggggaactc ttgcctcgtn tetggctggg gtctgctggc gaacggcaga
                                                                       360
atgectaceg tyctgcactg egtgaacgtg teggtggtgt etgaggangt etgeagtaag
                                                                       420
etetatgace egetgtacea ecceageatg ttetgegeeg geggagggea agaceagaag
                                                                       480
gactootgoa acggtgacto tgggggdeec otgatotgoa acgggtactt goagggcett
                                                                       540
gtgtfttttg gsaaageere gtgtggeeaa ettggegtge eaggtgteta caecaacete
                                                                       600
tgcaaattca ctgagtggat agagaaaacc gtccagncca gttaactctg gggactggga
                                                                       660
acccatgasa ttgaccccca satacatect geggaangaa tteaggasta tetgtteeca
                                                                       720
geocetecte coteaggee aggagteeag geocecagee ectectecet caaaceaagg
                                                                       78D
gtacagates coagesests steesteaga escaggagts cagassesse agesestent
                                                                       84D
contragace cappagtora secretore entragace aggaptorag acceccage
                                                                       900
contented teapaceday gggtgeagge codeaaced tenteentea gagteagagg
                                                                       960
treaageece caaccerteg ticeceagae ceagaggine aggiceeage certectee
                                                                      1020
tragaccoag oggicraatg coapetagan intocetgia cacagigoco cetigiggoa
                                                                      1DB0
```

ngttgaccca accttaccag ttggtttttc attttttgtc cctttcccct agatccagaa

atamagtntm mgagmagcgc manmamm

<210> 176
<211> 205

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<212> PRT
      <213> Homo sapien
      <220>
      <221> VARIANT
      <222> (1) ... (205)
      <223> Kaa = Any Amino Acid
      <400> 176
Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp
                                     10
Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu
                                25
Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Net Val
Glu Ala Ser Leu Ser Val Arg Ris Pro Glu Tyr Aso Arg Leu Leu
Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser
                    70
                                        75
Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly
                                     90
Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Gly Arg Met
            100
                                105
                                                     110
Pro Thr Val Leu His Cys Val Asn Val Ser Val Val Ser Glu Xaa Val
                                                125
        115
                            120
Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys Ala
                                             140
                        135
Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly Gly
                    150
                                        155
Pro Leu Ile Cye Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly Lys
                165
                                    170
                                                         175
Ala Pro Cys Gly Gin Leu Gly Val Pro Gly Val Tyr Thr Asn Leu Cys
                                185
Lys Phe Thr Glu Trp Ile Glu Lys Thr Val Gln Xaa Ser
        195
                            200
      <210> 177
      <211> 1119
      <212> DNA
      c213> Homo sapien
      <400> 177
                                                                        бØ
gogoactogo agocotggoa ggoggoactg ptoatggaaa acgaattgtt otgotogggo
gtoctggtgc atcogoagtg ggtgctgtca gccgcacact gtttccagaa ctcctacacc
                                                                       120
atogggctgg gcctgceceg tettgaggcc gaccaagagc cagggagcca gatggtggag
                                                                       180
peragretet cogtacogea recagagtae aacagaceet tortegetaa coaceteato
                                                                       240
                                                                       300
etcatcaagt tggacgaatc cgtgtccgag tctgacacca tccggagcat cagcattgct
togcagtgcc ctaccgoggg gaactottgc ctogtttctg gctggggtct gctggcgaac
                                                                       360
gatgetgtga ttqccatcca gteecagaet gtgggagget gggagtgtga gaagetttee
                                                                       420
caaccetage agggttgtac cattleggea acttecagtg caaggaogte etgetgeate
                                                                       480
ctcactgggt getcactact getcactgca teacceggaa cactgtgate aactagecag
                                                                       540
carratagtt ctorquagto agactatoat gattactgtg ttgactgtgc tgtctattgt
                                                                       600
actaaccatg cogatgitta ggtgaaatta gogtcacttg goctcaacca tottggtato
                                                                       66D
cagttatect cactgaatty agattteety etteagtgte agecattece acataattte
                                                                       72D
tgacctacag aggtgaggga teatataget étteaaggat getggtaete ceeteacaaa
                                                                       780
```

ttpatttoto otgitgiagi gasaggigog coctolggag celoccaggg igggigliges	84 D
egicacaatg atgaatgtat gategigtic coattaceca aageettiaa ateectests	9 <b>0</b> D
ctraptarac cagggraggt ctagrattto ttratttagt gtatgctgtc cattcatgca	
accacctong gactoctgga ttototsect agttgagete etgeatgetg cetecttggg	
gaggtgaggg agagggccca tggttcaatg spatctgtgc agttgtaaca cattaggtgc	
ttaataaca gaagctgtga tgttassasa sasassas	1119

c210> 178

c211> 164

<212> PRT

<213> Homo sapien

<220>

<221> VARIANT

<222> (1) ... (164)

<223 > Xaa - Any Amino Acid

<400> 178

Met Glu Asn Glu Leu Phe Cys Ser Gly Val Leu Val His Pro Gln Trp 10 Val Leu Ser Ala Ala His Cys Phe Gln Asn Ser Tyr Thr Ile Gly Leu 25 Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met Val 40 Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu Ser Asp Thr Ile Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala Gly Asn Ser Cys Leu Val Ser Gly Trp Gly Leu Leu Ala Asn Asp Ala Val . 105 lle Ala Ile Glm Ser xaa Thr Val Gly Gly Trp Glu Cys Glu Lys Leu 125 120 ger Gin Pro Trp Gln Gly Cys Thr Ile Ser Ala Thr Ser Ser Ala Arg 135 Thr Ser Cys Cys Ile Leu Thr Cly Cys Ser Leu Leu Leu Thr Ala Ser 150 Pro Gly Thr Leu

<210> 179

<211> 250

<212> DNA

<213> Komo sapien

<400> 179

ctggagtgcc ttggtgttc eagcectgc aggaagcaga atgcacettc tgaggcacet 60 ccagctgccc ccggccgggg gatgcgaggc tcggagcacc cttgcccggc tgtgattgct 120 gccaggcact gttcatctca gcttttctgt ccctttgctc ccggcaagcg cttctgctga 180 aagttcatat ctggagcctg atgtcttaac gaataaaggt cccatgctcc acccgaaaaa 240 aaaaaaaaa

<210> 180

<211> 202

<212> DNA

<213> Homo eapien

```
<400> 180
 actagoccag tgPggtggaa ttccattgtg ttgggcccaa cacaatggct acctetaaca
                                                                          60
 teacceagae eccycecety eccytecce acyctyctyc taacgacagt atgatyctta
                                                                         120
 chetgetact eggaaactat tittatgtaa tiaatgtatg cittetigti tataaatgee
                                                                         180
 tgetttaaaa aaaaaaaaaaa aa
                                                                         202
       <210> 101
       <211> 55B
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(558)
       \langle 223 \rangle \square = A, T, C \text{ or } G
       <400> 181
tecytttgkt naggtttkkg agacameeck agacetwaan etgtgteaca gaetteyngg
                                                                          60
aatgittagg cagigotagi aaittoytog taatgattot gitattacit tootnattot
                                                                         120
ttattcetct ttcttetgaa gattaatgaa gttgasaatt gaggtggata aatacsaaaa
                                                                         180
ggtagtgtga tagtataagt atctaagtgc agatgaaagt gtgttatata tatccattca
                                                                         240
asattatgca agttagtaat tactcagggt taactaaatt actttaatat gctgttgaac
                                                                         300
ctactctgtt ccttggctag aaaaaattat aaacaggact ttgttagttt gggaagccaa
                                                                         360
attgatasta ttotatgtto taasagttig gotatacata aattattaag aastatggaw
                                                                         420
ttttettccc aggsatatgg kgttcatttt atgaatatta cserggatag awgtwtgagt
                                                                         480
assaycagit tiggiwaata ygiwaataig tombaaataa acaakgotti gacttattic.
                                                                         540
Caaaaaaaa aaaaaaaa
                                                                         550
      <210> 182
      <211> 479
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc feature
      <222> (1) ... (479)
      <223> n = A,T,C or G
      <400> 192
acagggwith grggatgeta ageococrga rwtygtttga tecaaccotg gettwittte
                                                                         60
agaggggaaa atgggggccta gaagitadag macatytagy tggtgcgmtg gcaccctgg
                                                                        120
cstdadadag astcccqagt agdtgggadt acaggdadad agtcadtgaa gdaggddtg
                                                                        180
ttwgcaattc acgttgccac ctccaactta aacattcttc atatgtgatg toottagtca
                                                                        240
ctmaggttaa actttcccac ccagaaaagg caacttagat aaaatcttag agtactttca
                                                                        3 D G
tactmttcta agtoctottc cagoctcact kkgagtoctm cytgggggtt gataggaant
                                                                        360
ntotottgge titotcasta sartototat yestotoatg Ettastttgg targostars
                                                                        420
awtgstgara aaattaaaat gttotggtty mactttaaaa araaaaaaaa aaasaaaaa
                                                                        479
      <210> 183
      <211> 384
      <212> DNA
      <213> Romo sapien
      <400> 183
aggegggage agsagetass gerssagece asgsagsgtg gesgtgersg cartggtgre
                                                                         60
agtaccagta ccaataacag tgccagtgcc agtgccagca ccagtggtgg cttcagtgct
                                                                        120
ggtgccagcc tgacogccac tctcacattt gggctettcg ctggccttgg tggagctggt
                                                                        180
gorageacca giggoagete iggigerigi ggitteteet acaagigaga ittiggatai
                                                                        240
```

```
igtiaaicet gecagietti eletteaage eagggigeat eeteagaaac elacteaaca
                                                                         30D
 cagcacteta ggeagecact atesateaat tgaagttgac aetetgeatt aratetattt
                                                                         36 D
 gccatttcaa aaaaaaaaa aaaa
                                                                         384
       <210> 184
       <211> 496
       c212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1),..(495)
       <223> n = A,T,C or G
       <400> 184
 accquattgg gaccqctqqc ttataagcga tcatqtyynt corgtatkac ctcaacqagc
                                                                         €0
 agggagatcg agtctatacg ctgaagaaat ttgacccgat gggacaacag acctgctcag
                                                                        120
 occatectge toggttetee ccagatgaca aatacteteg acacegaate accateaaga
                                                                        180
 aacgetteaa ggtgeteatg acceageaae egegeeetgt cetetgaggg tecettaaae
                                                                        240
 tgatgtettt tetgecacet gttaceeste ggagaeterg taaccaaact etteggaetg
                                                                        300
 tgagecetga tgeetttttg ecagecatae tetttggeat ccagtetete gtggegattg
                                                                        36D
 attatgettg tgtgaggcaa teatggtgge ateaeccata aagggaacae atttgaettt
                                                                        42D
 tttttctcat attttaaatt actacmagaw tattwmagaw waaatgawtt gaaaaactst
                                                                        480
 taaaaaaaa aaaaaa
                                                                        496
       <210> 185
       <211> 384
       <212> DNA
       <213> Homo mapiem
       <400> 185
gctggtagcc tatggcgkgg cccacggagg ggctcctgag gccacggrac agtgacttcc
                                                                         60
caagtateyt gegesgegte thetaeegte cetacetgea gatetteggg cagatteece
                                                                        120
aggaggacat ggacgtggcc otcatggago acagcaactg ytcgtcggag cccggcttct
                                                                        180
gggcacaccc tectggggec caggegggca cetgegtete coagtatgec aactggotgg
                                                                        240
tggtgetget cetegteate tteetgeteg tggecaacat cetgetggte aacttgetea
                                                                        300
togocatgit cagitacaca tioggosaag tacagggcaa cagogatoto tactgggaag
                                                                        360
pogoagogtt accepteteat cogg
                                                                        384
      <210> 186
      <211> 577
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(577)
      <223> n = A, T, C or G
      <4DG> 186
gagttagete etecacaace tigatgaggt egtetgeagt ggeetetege ticatacege
                                                                        БÔ
tnecatoste atactgtagg tttgecaeca cytectggca tettggggcg gentaatatt
                                                                       120
ccaggaaact ctcaatcaag tcaccgtcga tgaaacctgt gggctggttc tgtcttccgc
                                                                       180
toggtgtgaa aggatotooc agaaggagtg otogatotto cocacacttt tgatgacttt
                                                                       240
attgagtega tictgcatgt cengcaggag gttgtaceng etctetgace gtgaggteae
                                                                       300
cagecetate atgeegttga mogtgeegaa gareacegag eettgtgtgg gggkkgaagt
                                                                       360
ctcacceaga ttetgcatta ecagagagec gtggcaaaag acattgacaa actcgcccag
                                                                       420
gtggaaaaag amcamotoot ggargigetn geegeteete gtemgitggi ggeagegeiw
                                                                       480
```

540

```
toottttgac acacaaacaa gttaaaggca ttttcagccc ccagaaantt gtcatcatec
                                                                        577
aagaintege acageacina tecagitiggg attamat
      <210> 187
      <211> 534
      <212> DNA
      <213 > Homo sapien
      とえなひか :
      <221> misc_feature
      <222> (1),,.(534}
      \langle 223 \rangle n = A,T,C or G
      <400> 187
aacatottee tgtataatgo tgtgtaatat cgatocgatn ttgtctgatg agaatycatw
                                                                         60
actkggeasa gmascattas agcctggaca ctggtattas aattcacaat atgcaacact
                                                                       12D
                                                                       180
ttaaacagtg tgtcaatctg ctcccyynac tttgtcatca ccagtctggg aakaagggta
tgccctattc acacctgtta aaagggcgct aagcattttt gattcaacat ctttttttt
                                                                        240
gacacaagto ogaaaaaago aaaagtaaac agttatyaat ttgttagoca attmacttto
                                                                       300
thratgggae agagreatyt gatthasass graaattgra taatattgag citygggage
                                                                       360
tgatatttga geggaagagt ageettteta etteaceaga cacaacteec ttteatattg
                                                                       420
ggatgttnac naaagtwatg tetetwacag atgggatget tttgtggcaa ttetgttetg
                                                                        480
aggatetere agtitattia eractigear aagaaggegt titetieete agge
                                                                        534
      <210> 188
      <211> 761
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...{761}
      <223> n = A,T,C or G
      <400> 188
agaaaccagt atototnama acaacctote ataccttgtg gacctaattt tgtgtgcgtg
                                                                         60
tgtgtgtgcg cgcatettat atagacagge acatettttt tacttttgta aaagettatg
                                                                      . 120
cclctttggt atctatatct gtgaaagttt taatgatctg ccataatgtc ttgggggacct
                                                                        180
tigicticig igtaeatggi actagagaaa acacctaint tatgagicaa totagiingt
                                                                        240
tttattogac atgaaggaam tttocagatn acamemotna camactotoc otkgackarg
                                                                        300
ggggacasag aaasgcaasa ctgamcataa raaacaatwa cctggtgaga arttgcataa
                                                                       360
acagasatwr ggtagtatat tgaarnacag catcattaaa rmgttwtktt wttotcoctt
                                                                        420
gcaaaaaaca tgtacngact tcccgttgag taatgccaag ttgttttttt tatnataaaa
                                                                        4 B G
                                                                       540
cttgcccttc attacatgtt tnaaagtggt gtggtgggcc asaatattga aatgatggaa
                                                                        600
ctgactgata asgctgtaca satssgtogt gtgcctsace agcascacag testgttgac
atgottaatt cacasatgot aatticette taaatgittg cisaaataca ciitgascia
                                                                        660
tttttctgtn ttcccagagc tgagatntta gattttatgt agtatnaagt gaaaaantac
                                                                        720
                                                                        761
gasaataata acattgaaga aaaananaaa aaanaasaaa a
      <210> 189
      <211> 482
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(492)
      <223> n = A,T,C or G
```

```
<400> 189
tittititt titgoogatn ctactattit attgcaggan gigggggigt atgcaccyca
                                                                         60
caccygygot atmagaagoa agaaggaagg agggaggge ragccccttg otgagcaara
                                                                        120
aagcogcotg ctgccttctc tgtctgtctc ctggtgcagg cacatgggga gaccttcccc
                                                                        180
AAGGCAGGGG ccaccagtec aggggtggga atacaggggg tgggangtgt gcataagaag
                                                                        240
tgataggcac aggccaccog gtacagacco ctcggctcct gacaggtnga tttcgaccag
                                                                        300
gtcattgtgc cotgeocagg cacagegtan atetggaaaa gacagaatge ttteotttte
                                                                        360
aaatttggot ngtoatngaa ngggoanttt tocaanttng gotnggtott ggtacnottg
                                                                        420
pttoggerea geteenegte casaasntst tesecennet cenaattget tgenggneee
                                                                        480
                                                                        482
      <210> 190
      <211> 471
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc_feature
      <222> (1)...(471)
      \langle 223 \rangle n = A,T,C or G
      c4005 19D
tttttttttt ttttaaaaca gtttttcaca acaaaattta ttagaagaat agtggttttg
                                                                         60
assactetes catecastsa saactaceat acaceaeatt acasetnssa atstneteea
                                                                        120
satgtriggt cassigater estggaerce ticasicite cacaigracy assgescasy
                                                                        180
egetttigae atacaatgea caaaaaaaaa aggggggggg gaccacatgg attaaaattt
                                                                        2,40
taagtactca tcacatacat taagacacag ttctagteca gtcnaaaatc agaactgcnt
                                                                        300
tgaassattt catgialges atcesacesa agsactinat iggigatesi ganineteta
                                                                        36Q
ctacatonac ottgatcatt gocaggaach aasagtthaa ancschongt acaasaansa
                                                                        42D
totgtaattn anticaacet oogtaongaa aaatniinni tafacactoo o
                                                                        471
      <210> 191
      <211> 402
      <212> DNA
      <213> Homo sepien
      <220>
      <221> misc_feature
      <222> (1)...(402)
      < 223 > n = A, T, C or G
      <400> 191
gagggattga aggtotgtto tastgtoggm otgttoagec acceaeteta acaagttget
                                                                         60
gtetteract ractgtetgt asgettttta accessarwg tatetteats satsgaseas
                                                                        120
attettemes agreacatet tetaggaset tittggatte agriagiata agetettesa
                                                                        180
cttcctttgt taagacttca totggtaaag tottaagttt tgtagaaagg aattyaattg
                                                                        24 D
ctogttotot aacaatgtoo totoottgaa gtatttggot gaacaaccca cotaaagtoo
                                                                       3QD
ctttgtgcat ccattttaaa tatacttaat agggcattgk tncactaggt taaattctgc
                                                                       360
aagagteate tgtetgeaaa agttgegtta gtatatetge ea
                                                                       402
      <210> 192
      <211> 601
      <212> DNA
      <213> Homo sapien
      <220×
     <221> misc feature
```

```
<222» (1)...(601)
      <223> n = A,T,C or G
      <400> 192
gapeteggat ecaataatet tigtetgagg geageaeaea taineagige eaiggnaaei
                                                                         6O
ggtctacccc acatgggage ageatgeogt agnitatataa ggtcattece tgagtcagac
                                                                        120
atgoytyttt gaytacogtg tgccaagtgo tggtgattot yaacacacyt coatcocgyt
                                                                        180
cttttgtgg& &&&&ftggc& cttktctgga actagcarga catcacttac aaattcaccc
                                                                        240
acgagacact tgasaggtgt Ascasagcgs ytcttgcatt gctttttgtc cctccggcac
                                                                        300
cagtigicas tactaacceg ciggitiges tocateacat tigigatetg tagetetgga
                                                                        350
tscatcteet gacagtactg aagaacttet tettitgitt caaaagcare tettggtgee
                                                                        420
tgttggatea ggtteceatt teccagteyg aatgtteaca tggeatattt wactteceae
                                                                       : 480
aaaacattgc gatttgaggc tcagcaacag caaatcctgt tccggcattg gctgcaagag
                                                                        540
cotegatgta geoggecage geosaggeag gegeogtgag coccaccage ageagaagea
                                                                        600
                                                                        601
g
      <210> 193
      <211> 608
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...(608}
      <223> n = A,T,C or G
      <400> 193
atacagocca natoccacca ogaagatgog ottgttgact gagaacetga tgoggtcact
                                                                         60
ggteeegetg tageceeage gaeteteeae etgetggaag eggttgatge tgeaeteytt
                                                                        120
cecaacgcag gcagmagcgg gscoggtcaa tgaactecay tegtggettg gggtkgacgg
                                                                        180
tkangtgeng gangaggets accacctege ggtccaccag gatgcccgac tgtgcgggac .
                                                                        240
ctgcagcgaa actcctcgat ggtcatgagc gggaagcgaa tgaggcccag ggccttgccc
                                                                        300
agaacettee geetgitete t<u>ggegteace</u> tgeagetget geegetgava eteggeeteg
                                                                        36D
gaccagogga caaaoggcrt tgaacagccg cacctcaogg atgcccagtg tgtcgcgctc
                                                                        420
caggammgsc accagogtgt coaggteast gtoggtgaag cootecgegg gtratggcgt
                                                                        480
ftgfagligtt titiglicgalig ticticcagge acaggetgge cagetgeggt teategaaga
                                                                        540
gtegegeetg egtgageage atgaaggegt tgteggeteg eagttettet teaggaacte
                                                                        600
cacgcaat
                                                                        608
      <210> 194
      <211> 392
      <212> DNA
      <213 > Homo sapien
      <220×
      <221> misc feature
      <222> (1)...(392)
      <223> n = A, T, C or G
      <400> 194
gaacggrigg acctigeric geatigiget igeiggeagg gaataceiig geaageagyi
                                                                        бD
deagheegag cageeceaga regetgeege degaagetaa geetgeetet ggeettedee
                                                                       120
tecgecteam tgeagameea gtagtgggag cactgtgttt agagttamga gtgaacactg
                                                                       180
tttgatttta ettgggaatt beetetgtta tatagetttt cecaatgeta atttecaaac
                                                                       240
pacaacaaca aaataacatg titgeetgtt aagtigtota aaagtaggig ottetgiatt
                                                                       300
tasagaeast attactgtte cetatectgc tigceetttc tgtetttett gkinctetgg
                                                                       360
aastaastat agitattaaa ggtigicani co
                                                                       392
```

```
<210> 195
      <211> 502
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...[502]
      \langle 223 \rangle n = A,T,C or G
      c400> 195
ccattkgagg ggtkaggkyc cagttyccga gtggaagaaa caggccagga gaagtgcgtg
                                                                        60
ocgagotgag goagatgttc ccacagtgac ccccagagoc stgggstata gtytotgacc
                                                                        120
cetencaagg aaagaceaes thetggggae atgggetgga gggeaggaee tagaggeaee
                                                                        180
aagggaagge cecatteegg ggatgtteee egaggaggaa gggaagggge tetgtgtgee
                                                                        240
ecccasgagg aagaggeest gagteetggg ateagacace cottoacgtg tatecccaca
                                                                        300
casatgeaag cteaceaagg teecetetes gteecettee stacaceets ameggeeact
                                                                        360
gscscacacc cacccagage acgreacecg ceatggggar tgtgctcaag gartegengg
                                                                        420
gcarcgtgga catcingtec cagaaggggg cagaatcicc aatagangga eigarcmatt
                                                                        480
gctmanaaea asaesmesaa aa
                                                                        502
      <210> 196
      <211> €65
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1) ... (665)
      <223> n = A,T,C or G
      <400> 196
ggttacttgg tttcattgcc accacttagt ggatgtcatt tagaaccatt ttgtctgctc
                                                                         60
cetetggaag cettgegeag ageggaettt gtaattgttg gagaataact getgaatttt
                                                                        120
wagetgtttk gagttgatts geaceaetge acceaeaxet teaatabgaa aacyawttga
                                                                        180
actwatttat tatcitgtga aaagtataac aatgaaaatt tigitcatac igtattkatc
                                                                        240
aagtatgatg aaaagcaawa gatatatatt cilitattat gitaaattat gatigccatt
                                                                        300
attmateggo mamatgiggm gigtatgito tittcacagt aminiatgcc tittgimact
                                                                        360
tcacttggtt attitattgt aaatgartta caaaattctt aatttaagar aatggtatgt
                                                                        420
watatttatt toattaattt otttootkyt ttaoytwaat titgaaaaga wigcatgatt
                                                                        480
tottgacaga aatogatott gatgotgtgg aagtagtttg accoacatoo ctatgagttt
                                                                        540
ttottagast gtataasggt tgtagcccat cnaacttesa agaaaaaaat gaccacatsc
                                                                        €00
tttgcaatca ggctgaaatg tggcatgctn ttctaattcc aactttataa actagcaaan
                                                                        650
aagtg
                                                                        665
      <210> 197
      <211> 492
      <212> DNA
      <213> Homo sapiem
      <230>
      <221> misc_feature
      <222> (1) . . . (492}
      <223 n = A,T,C or G
      <400> 197
Ettinfitte tettettege aggaaggate coatttattg tggatgeatt tecacaatat
                                                                        60
atgtttettg gagcgatcca ttatcagtga asagtatcaa gtgtttataa natttttagg
                                                                       120
```

DISCOUNT AND DISCOUNTY

```
aaggoagatt cacagaacat gotngtongo tigoagtitt acctogtana gatnacagag
                                                                        180
aattatagto naaccagtaa acnaggaatt tacttittoaa aagattaaat ccaaactgaa
                                                                        240
casaatteta cootgaaact tactecatee aaatattgga ataanagtea geagtgatac
                                                                        300
attototot gazetttaga tittotagaa aaatatgisa tagigatcag gaagagetel
                                                                        360
tgttcaaaag tacaacnaag caatgttocc ttaccatagg cottaattca aactttgato
                                                                        420
cattteacte ceatcacggg agteaatget acctgggaca cttgtafttt gttcatnetg
                                                                        480
ancatggett aa
                                                                        492
      <210> 198
      <211> 478
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> {1}...(478)
      \langle 223 \rangle \pi = A, T, C or G
      <400> 198
tttnttttgn atttcantet gtannaanta ttttcattat gtttattana aaaatatnaa
                                                                         60
tgtntccacn acaaatcatn ttacntnagt aagaggccan ctacattgta caacatacac
                                                                        120
tgagtatett ttgaaaagga caagtttaaa gtanacncat attgccganc atancacatt
                                                                        180
tatacatggc tigatigata titagcacag canaaaciga gigagitacc agaaanaaat
                                                                        240
natatatgto aatongattt aagatacaaa acagatoota tggtacatan catontgtag
                                                                        300
gasttstssc tttatsttta otsaaastoa atsoasttoo tetacaaasa satsecosta
                                                                        360
ageattctag tacctctact coatggttas gastcgtaca cttstgttta catatgtnca
                                                                        420
gggtaagaat tgtgttaagt naanttatgg agaggtopan gagaaaaatt tgatnoaa
                                                                        478
      <210> 199
      <211> 482
      <212> DNA
      <213> Homo zapien
      <220 >
      <221> misc_feature
      <222> (1)...(482)
      <223> n = A,T,C or G
      <400> 199
agtgachtgh cotocasoss ascorptique toasquitque agractques atcaquetta .
tgctagttcc tgtcatctat tccctactaa atqcaqactq qaqqqqacca aaaaqqqqca
                                                                        120
traactroag otggattatt ttggagootg caaatotatt cotacttgta pggactttga
                                                                        180
agtgatteag ttteetetae ggatgagaga etggeteaag aatateetea tgeagettta
                                                                        240
tgaagoonao totgaacaog otggttatot nagatgagaa noagagaaat aaagtomaga
                                                                        300
saatttacct ggangasaag aggetttngg etggggacca teccattgas cettetetta
                                                                       360
anggacttta agaanaaact accacatgin tgingtatcc iggigcingg cogittanig
                                                                        420
ascningach neacceitht ggaatamant citigachgen teetgaacht gelecteige
                                                                        480
                                                                        482
      <210> 200
      c211> 270
      c2125 DNA
      <213> Romo Bapien
      <220>
      <221> misc_feature
      <222> (1)...(270)
      <223> n = A,T,C or G
```

```
<400> 200
 cggccgcaag tgraacteca gctggggccg tgcggacgaa gattotgcca gcagttggtc
                                                                          60
 egactgegae gaeggeggeg gegaeagteg eaggtgeage gegggegeet geggtettge
                                                                         120
aaggotgago tgaogoogoa gaggtogtgt cacgtoccac gacottgaog cogtoggga
                                                                         180
cedecadege abadecedat assubcabas adectedada edeceteda assababedae
                                                                         240
ccdadedata cheadataca adtaccacc
                                                                         270
      <210> 201
      <211> 419
      <212> DNA
      <213> Romo sepien
      <220>
      <221> misc_feature
      <222> (1)...(419)
      <223> n = A, T, C \Leftrightarrow C
      <400> 201
ttttttttt ttttggaate taetgegage acageaggte ageaacaagt ttattttgea
                                                                          60
gctagcaagg taacagggta gggcatggtt acatgttcag gtcaacttcc tttgtcgtgg
                                                                         120
ttgattggtt tgtctttatg ggggcggggt ggggtagggg aaancgaagc anaantaaca
                                                                         180
tggagtgggt geaccetece tgtagaacet ggttacnaaa gettggggca gtteaeetgg
                                                                         240
tetytemece teattttett gacateaatg ttattagaag teaggatate ttttagagag
                                                                         300
tccactgtnt ctggagggag attagggttt cttgccaana tccaancaaa atccacntga
                                                                         360
aasagttgga tgatncangt acngsatacc ganggcatan ttctcatant oggtggcca
                                                                         419
      <210> 202
     <211> 509
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc_feature
      <222> (1)...(509)
      \langle 223 \rangle n = A,T,C or G
      <400> 202
tituttitt titititit tettititi titititet ettititit titititet
                                                                         60
tggcacttaa tccatttta tttcaaaatg tctacaaant ttnaatnonc cattatacng
                                                                        120
gtnattttnc aaaatetaaa nnttatteaa atntnageea aanteettae neaaatnnaa
                                                                        180
tacnoncasa astosassat atsontotot ticagosase tingitsest asattassas
                                                                        240
astatatacg griggigiti traasagiars attatritas carigrasar ainttinnas
                                                                        300
ggaactasaa taaaaaaaaa cactneeges aaggttaaag ggsseaseaa attentttta
                                                                        36 D
caacanchno nattataaaa atcatatoto aaatottagg ggaatatata ottoacachg
                                                                        420
ggatettaze tittacinea ettigittai tittitanaa eezitginti gggeecaaca
                                                                        480
caatggnaat nooneenene tggaetagt
                                                                        509
      <210> 203
      <211> 583
      <212> DNA
     <213> Homo sapien
     <220×
     <221> misc_feature
     <222> {1}...(583)
     \langle 223 \rangle n = A,T,C or G
```

```
<400> 203
ttttttttt tittttege coccetett ataaaaaaca agttaccatt ttattitact
                                                                        60
tacacatatt tattttatas ttggtattag atattcaaaa ggcagttttt aasatcaasc
                                                                        120
taaatggaaa otgoottaga tacataatto ttaggaatta gottaaaato tgootaaagt
                                                                        180
gassatette totagetett ttgaetgtaa atttttgaet ettgtaasae atecaaatte
                                                                        240
attiticity toitiseast isicisatet ticcatitit tocciatico segicastit
                                                                       COE
gottototag cotcatttoo tagotottat otactattag taagtggott tittectaaa
                                                                        36D
agggaaaaca ggaagagana atggcacaca aaacaaacat tttatattca tatttetacc
                                                                       42D
tacgttaata aaatagcatt ttgtgaagce agctcaaaag aaggcttaga tccttttatg
                                                                       480
tecattttag teactaaacg atatemaaag tgecagaatg caasaggttt gigaacattt
                                                                       540
attcasaago tastatasga tatttcacat actcatcttt ctg
                                                                       583
      <210> 204
      <211> 589
      c212> DNA
      <213> Homo espien
      <220>
      <221> misc_feature
      <222> (1)...(589)
      <223> n = A, T, C or G
      <400> 204
tititititit tititititi tititinete tietititit tiganaatga ggategagti
                                                                        €0:
tttcactctc tagatagggc atgaagaaaa ctcatcttc cagctttaaa ataacaatca
                                                                       12D
                                                                       180
aatetettat getatateat attittaagti aaactaatga gicaetgget tafetfetee
tgaaggaaat ctgttcattc Etctcattca tatagttata tcaagtacta ccltgcatat
                                                                       240
tgagaggttt ttottotota tttacacata tatttocatg tgaatttgta tcazacottt
                                                                       30D
attiteatge aaactagaaa ataafgtnit ettitgeata agagaagaga acaatatnag
                                                                       360
cattscasas ctgctcasst tgtttgttss gnttatccat tatasttagt tnggcaggag
                                                                       420
ctaatacaaa toacatttac ngacnagcaa taataaaact gaagtaccag ttaaatatcc
                                                                       480
aaaataatta aaggaacatt titageetgg gtataattag etaatteaet tiacaageat
                                                                       540
                                                                       589
ttattnagaa tgaattoaca tgttattatt contagocca acacaatgg
      <210> 205
      <211> 545
      <212> DNA
      <213> Homo sapien
      <220>
      <221> migc_feature
      <222> (1)...(545)
      \langle 223 \rangle n = A,T,C or G
      <400> 205
tittintiti titticagt estasicaga acestettie tittiatati taasattoat
                                                                        60
agasaagtgc cttacattta ataaaagttt gtttctcaaa gtgstcagag gaattagsta
                                                                       120
                                                                       180
tngtottgaa caccaatatt aatttgagga aaatacacca aaatacatta agtaaattat
                                                                       240
ttaagatcat agagettgta agtgaaaaga taaaatttga eetcagaaac tetgageatt
assautocae tattagessa tasaftaeta tygaettett getttasttt tytgatysat
                                                                       300
atggggtgte actggtaaac caacactte tgaaggatac attacttagt gatagattet
                                                                       360
tabgtacttt getanatnac gtggatabga gttgacaagt ttctctttct tcaatctttt
                                                                       420
                                                                       480
aaggggenga ngaaatgagg aagaaasgas aaggattacg catactgtte Ettctatngg
                                                                       $40
asggattaga tatgtttcct ttgccaatat tasaasaata atastgttta ctactagtga
                                                                       545
Bacco
```

<210> 206 <211> 487

```
<212 > DNA
       <213> Homo sapien
       <220>
       <221> mise feature
       <222> (1)...(487)
       \langle 223 \rangle n = A,T,C or G
       <400> 206
 Etttttttt titttagte aagitteina titttattat aattaaagte tiggteatit
                                                                          6 D
 cattlattag ctctgcaact tacatettte aattaaagsa acgttnttag acaectgtna
                                                                         120
caatttataa atgtaaggtg ccattattga gtanatatat tootocaaga gtggatgtgt
                                                                         180
cecttetece accaactast gaancageaa cattagttta attttattag tagatnatae
                                                                         24Q
actgotgoza acgotaatto tottotocat coccatging atattgigta taigigigag
                                                                         300
ttggtnagaa tgcatcanca atctnacsat caacagcaag atgasgctag gcntgggctt
                                                                         360
teggigamam tagacigigi eigicigaat caaaigatei gaeetateet eggiggeaag
                                                                         420
Racticiticga acceptition caaaggongo typicacatti giggonicin tigeactigi
                                                                         480
                                                                         487
      c2105 207
      <211> 332
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(332)
      <223> n = A, T, C or G
      <400> 207
tgaattgget aaaagactge atttttanaa etageaacte ttatttettt eetttaaaaa
                                                                         60
tacatagoat taaatoocaa atootattta aagacetgae agettgagaa ggtcaetaet
                                                                        130
geathtatag gaccttetgg tggttetget gttachtttg aantetgaes atcettgana
                                                                        180
atctttgcat gcagaggagg taaaaggtat tggattttca cagaggaana acacagcgca
                                                                        240
                                                                        300
gaaabgaagg ggccaggett actgagetbg tecactggag ggctcatggg tgggacatgg
aaaagaaggd agddtaggdd ctgggggagdd ca
                                                                        332
      <210> 208
      <211> 524
      <2125 DNA
      <213> Homo sepien
      <220>
      <221> misc_feature
      <222> (1)...(524)
      <223> n * A,T,C or G
      <4QD> 208
agggcgtggt gcggagggcg ttactgtttt gtctcagtaa caataaatac aaaaagactg
                                                                         60
9ttgtgttet ggccccatec aaccacgaag ttgatttete ttgtgtgcag agtgactgat
                                                                        120
tttaaaggac atggagettg teacaatgte acaatgteac agtgtgaagg geacaeteac
                                                                        180
tecogegigs ticacettia geaaccasca atageteste agteestact tetasatact
                                                                        240
titggcagaa tactinitga aacitgcaga tgataactaa gatccaagat atticccaaa
                                                                        300
gtaantagaa gtgggtcatn atattaatta cetgttenen teagetteen tttacaagte
                                                                        360
atgageceag acactgacat casactaage coacttagae teoteaceae cagtetgtee
                                                                        420
tyteateaga caggaggety teacettyae caaattetea ecagteaate atetateeaa
                                                                        480
adaccattac ctgatccact tccggtaatg caccaccttg gtga
                                                                        524
```

```
<210>.209
      <211> 159
      <212> DNA
      <213> Homo sapien
      <4D0> 209
gggtgaggaa atccagagtt gccatggaga aaattccagt gtcagcattc ttgctccttg
                                                                        60
tggccctctc ctacactctg gccagagata ccacagtcaa acctggagcc aaaaaggaca
                                                                        120
                                                                       159
casaggacto tegacecasa etgececaga coeteteca
      <210> 210
      <211> 256
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1) ... (256)
      <223> n = A,T,C or G
      <400> 210
actocotyge agacaaayye agagyagaya getetyttäy ttetytytty ttyaaetyee
                                                                        60
                                                                       12D
actgaattte tittecacttg gaetattaea tgecantiga gggaetaatg gaaaaacgta
Eggggagatt ttanccaatt tangtnigta aatggggaga etggggcagg egggagagat
                                                                       180
ttgcaqqqtg naaatgggan ggctggtttg ttanatgaac agggacatag gaggtaggca
                                                                       24D
                                                                       256
ccaggatget saatca
      <210> 211
      <211> 264
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> {1}...(264)
      <223> n - A, T, C or G
      <4D0> 211
                                                                        бD
acattgtttt tttgagataa agcattgaga gagctctcct taacgtgaca caatggaagg
actggaacae atacceacat cittgtictg agggataatt tictgataaa gicttgctgt
                                                                       120
atattcaago acatatgita tatattatto agitcoatgi italagocta gitaaggaga
                                                                       160
ggggagatac attongaaag aggactgmaa gaaatactca agtnggaama cagaammaga
                                                                       240
aaaaaaggag caaatgagaa gcet
                                                                       264
      <210> 212
      <211> 328
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1),,,(328)
      <223> n = A,T,C or G
      <400> 212
acceasast cesstgetgs stattbgget testtattee canattettt gattgtesss
                                                                        60
ggatttaatg ttgtctcagc ttgggcactt cagttaggac ctaaggatgc cagccggcag
                                                                       120
gtttatatat gcagcaacaa tattcaagog cgacaacagg ttattgaact tgcccgccag
                                                                       180
```

```
tinastites ticccatigs citggsated tistestesg desgagagat igasaatita
                                                                        240
 cccctacnae tetttaetet etgganaggg ceagtggtgg tagetataag ettggeeara
                                                                        3 D O
ttttttttc ctttattcct ttgtcaga
                                                                        328
       <210> 213
       <211> 250
       <212> DNA
       <213> Homo sapien
       <220>
       <221> misc_feature
       <222> (1)...(250)
       <223> n = A,T,C or G
       <400> 213
acttatgage agagegacet atconagtgt agactgaata eaactgaatt ctotecagtt
                                                                         60
tamagcattg ctcactgmag ggatagamgt gactgccagg mgggmmagtm mgccmmagget
                                                                        120
cattatgoca aagganatat acatttoaat totocaaact tottoctcat tocaagagtt
                                                                        180
tteaafatft geatgaacet getgataane eatgttaana aacaaatate tetetnacet
                                                                        240
totoatoggt
                                                                        250
      <210> 214
      <211> 444
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc feature
      <222> (1)...(444)
      <223> n = A,T,C or G
      <400> 214
accompante camigetyma tattiggett cattaticee agaitettig attgicamag
                                                                         БÔ
gettteatgt tgtdtdagdt tgggdadttd agttaggadd taaggatgdd agorggoaga
                                                                        120
tttatatatg cagcaacaat attcaagege gacaacaggt tattgaactt geeegeeagt
                                                                        180
tgaatttcat tcccattgac ttgggatcct tatcatcagc canagagatt gaaaatttac
                                                                        240
occiacgact ctttactetc tggagagage cagtggtggt agctataage ttggccacat
                                                                        300
Etttettec tttattectt tgreagagat gegaticate catatgetan aaaccaacag
                                                                        360
agtgactttt acaaaattcc tatagamatt gtgaataaaa ccttacctat agttgccatt
                                                                        420
actitgctct ccctaatata cctc
                                                                        444
      <210> 215
      <211> 366
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1)...(366)
      <223> n = A, T, C or G
      <400> 215
acttatgage agagegaeat atecaagtgt anactgaata aaactgaatt efeteeagtt
                                                                        60
tabagcattg ctcactgaag ggatagaagt gactgccagg agggaaagta agccaaggct
                                                                       120
cattatgcca aagganstat acatttcaat totocasact tottoctcat tocaagagtt
                                                                       180
ttcaatattt gcatgaacct gctgataagc catgttgaga aacaaatatc tctctgacct
                                                                       24D
teteateggt aageagagge tgtaggeaae atggaceata gegaanaaaa aaettagtaa
                                                                       300
treasgrigh titriacert glascraggh threascess ggiggasete techetacht
                                                                       360
```

DEICHOCIN- JAIO ... ALGAGGGAATT .

-..

```
ggtgcc
                                                                         366
       <210> 216
      <211> 260
      <212> DNA
      <213> Homo sapien
      <220×
      <221> misc_feature
      <222> (1) ... (260)
      \langle 223 \rangle n = A,T,C or G
      <400> 216
ctgtataaac agaactccac tgcangaggg agggcogggc caggagaatc tccgcttgtc
                                                                         60
caagacaggg gcctaaggag ggtctccaca ctgctnntaa gggctnttnc atttttttat
                                                                        120
teataaaag tunaaaaggo otottotoaa otttttooo ttuggotgga aaatttaaaa
                                                                        180
atcassatt tootnaaget ntosagotat catatact ntacootgas assgosscat
                                                                        240
aattottoot teeeteettt
                                                                        260
      <210> 217
      <211> 262
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...{262}
      <223> n = A,T,C or G
      c400> 217
acchacgigg glaagittan aaalgitata atticaggaa naggaacgca tataaligta
                                                                         60
tettgeetat aattitetat ittaataagg aaatageasa tiggggiggg gggssigtag
                                                                        120
ggcattctac agtitgagca asatgcaatt aaatgtggaa ggacagcact gaaaaatttt
                                                                        180
atgaataate tgtatgatta tatgteteta gagtagattt ataattagee aettaeeeta
                                                                        240
atateettes tgettgtass gt
                                                                        262
      <210> 218
      <211> 205
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (205)
      <223> n = A,T,C or G
      <400> 218
accaaggigg igcattaccg gaaniggaic aangacacca icgiggccaa ccccigagca
cocctatcae ctcccttttg tegtaeectt ggeeccttgg seetgecceg gccssgectc
                                                                        120
aggeeteece agttetactg acettigies tianginina ngtecagggi igetaggada
                                                                        180
anaaatcage agacacaggt gtaaa
                                                                        205
      <210> 219
      <211> 114
      <212> DNA
      <213> Home sepien
     <400> 219
```

```
tactattttt teteagtaac aataaataca aaaagaetgg tigtgtteeg geeceateea
                                                                         60
 accacaaat teatttetet teteteeaa atgactgatt tiaaaggaca tega
                                                                         114
       <210> 220
       <211> 93
       <212> DNA
       <213> Homo sapien
       <40D> 22D
 actagocago acaaaaggca gggtagoctg aattgottto tgototttac atttotttta
                                                                         БŌ
 asatasgeat thagtgetea precetactg agt
                                                                         93
       <210> 221
       c211> 167
       <212> DNA
       <213 > Homo sapien
      <220×
       <221> misc feature
       <222> (1)...(167)
      <223> n = A,T,C or G
      <400> 221
actangigea ggigegeaca aatattigic gatatteeet teatetigga ticeatgagg
                                                                         60
tettttgece ageetgtgge tetactgtag taagtttetg etgatgagga geeagnatge
                                                                        J30
occepactae ettecetgae getececana aateacceaa eetetgt
                                                                        167
      <210> 222
      <211> 351
      <212> DNA
      <213> Homo sapien
      <400> 222
agggogtggt goggagggog gtaobgacot cabtagtagg aggalgoatt otggcacoco
                                                                         60
gttettesee Egteeceaa teettsaaag geestactge ataaagteaa caacagataa
                                                                        120
atgittgcig aattaaagga tggatgaaaa aaattaataa tgaattittg cataatccaa
                                                                        180
ttttctcttt tatatttcta gaagaagttt ctttgagcct attagatccc gggaatcttt
                                                                        24D
taggtgagca tgattagaga gettgtaggt tgettttaca tatatetgge atatttgagt
                                                                        300
ctogtatosa ascastegat tggtasaggt ggtattattg tattgatasg t
                                                                        351
      <210> 223
      <211> 383
      c212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(383)
      <223> n = A, T, C or G
      <400> 223
aaaacaaaca aacaaaaaa acaattotto attoagaaaa attatottag ggactgatat
                                                                        60
tggtaattat ggtcaattta atwrtrttkt ggggcatttc cttacattgt cttgacaaga
                                                                       120
ttaaaatyte tytyeeaaaa ttttytattt tatttyyaya eetettatea aaaytaatye
                                                                       180
tyrcasaggs agtotaaggs attagtagtg ttocombose ttgtttggag tgtgctatto
                                                                       240
taasagattt tgatttcctg gaatgacast tatattttaa ctttggtggg ggaaanagtt
                                                                       300
ataggaccac agtoticact totgatactt gtaaattaat ottttattgc acttgttttg
                                                                       360
accattaago tatatgttta aaa
                                                                       £BE
```

```
<21D> 224
      <211> 320
      <212> DNA
      <213> Homo sapien
      <400> 224
cccctgaagg cttcttgtta gaaaatagta cagttacaac caataggaac aacaaaaaga
                                                                        60
aaaagtttgt gacattgtag tagggagtgt gtacccctta ctccccatca aaaaaaaaat
                                                                       120
ggatacaigg tizaaggata raagggcaat eltttatcal algiticlasa agagaaggaa
                                                                       180
gagaaaataq taqtttctcr aaatggaagc cettaaaggt getttgatac tgaaggacac
                                                                       240
asatgtggcc gtccatcctc ctttaragtt gcatgacttg gacacggtaa ctgttgcagt
                                                                      300
tttaractom gcattgtgac
                                                                       320
      <210> 225
      <211> 1214
      <212> DNA
      <213> Homo sapien
      <400> 225
gaggactgca geocgeacte geagecetgg caggoggeac tggteatgga aaaogaattg
                                                                        60
ttotgotogg gogtootggt goatoogoag tgggtgotgt cagoogoaca otgtttooag
                                                                       120
aactootaca coatcogget gggcctgcac agtottgagg ccgaccaaga gccagggagc
                                                                       180
cagatggtgg aggecagect etcegtacgg cacceagagt acaacagace ettgeteget
                                                                       24 D
aacgacetea tgeteateaa gttggaegaa teegtgteeg agtetgaeae cateeggage
                                                                       3 O D
atcagcatty officecasty occhaecycy gygaactett protegette tygetgygyt
                                                                       360
chackageda acadeagaat dechacedty ctacagtacy taaacatate agtagtatet
                                                                       42D
gaggaggtot gcagtaagot ctatgaccog ctgtaccaco ccagcatgtt ctgcgccggc
                                                                       480
ggagggcaag accagaagga ctectpeaac ggtgactetg gggggeceet gatctgcaac
                                                                       540
gggtactige agggeeligt gielliegga aaageeeegi giggeeaagi iggegigeea
                                                                       600
ggtgtctaca ccaacctctg caaattcact gagtggatag agaaaaccgt ccaggccagt
                                                                      · 660
taactotggg gactgggaac ccatgaaatt gacccccaaa tacatcctgc ggaaggaatt
                                                                       720
cagodatate totteecage rectectere teaggereag gagteragge recrageece
                                                                       78Q
tentennica ascraagggt acagatence agencetect contragace caggagtera
                                                                       B40
gacceccag coeffecte eteagaecca ggagtecage eccteete teagaeccag
                                                                       900
gagtocagae coccoageco etoctocoto agacocaggo gtecaggeco coaaccecto
                                                                       960
ctroctcaga ctcagaggtr caagreecea accretertt receagacee agaggtreag
                                                                      1020
gteccageer etertecete agaeccageg gtecaatger acctagaete teorigiaca
                                                                      1080
Cagigoroco tigiggcarg tigacocaac citaccagit ggittitcat tittigicoc
                                                                      1140
tttcccctag atccagaaat aaagtetaag agaagegeaa aaaaaaaaaa aaaaaaaaa
                                                                      1200
在888 各名在本本在本本本
                                                                      1214
      <21D> 226
      <211> 119
      <212> DNA
      <213> Homo sapien
      <400> 226
accoagtatg tgcagggaga cggaacccca tgtgacagec cactccacca gggttcccaa
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agaacctggc ccagtcataa tcattcatcc tgacagtggc aataatcacg ataaccagt
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      <210> 227
      <211> B18
      <212 > DNA
      <213> Homo mapien
      <400> 227
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                                                                        120
 acggacggtt cttagcacaa tttgtgaaat ctgtgtaraa ccgggctttg caggggagat
                                                                        180
 aattitooto otoiggagga aaggiggiga tigacaggoa gggagacagi gacaaggota
                                                                        240
gagaaagcca cgctcggcct tctctgaacc aggatggaac ggcagacccc tgaaaacgaa
                                                                        300
schightere thecastes coschergs gaseeceat chaachtech achggasss
                                                                        360
agggeeteet caggageagt teaagagttt teaaagataa egtgaeaact accatetaga
                                                                        420
ggaaagggtg cacceteage agagaageeg agagettaae tetggtegtt tecagagaea
                                                                        480
acctgotggc tgtottgggs tgogecesgc ctttgagagg coactacece atgaacttet
                                                                        540
gccatccact ggacatgaag ctgaggacac tgggcttcaa cactgagttg tcatgagagg
                                                                        600
gacaggetet geceteaage eggetgaggg cageaaceae teteeteee titeteaege
                                                                        660
sasyccatto concentro agacostaco atgaagesse gagacocasa cagtitigget
                                                                        720
caagaggata tgaggactgt otcagootgg ctttgggctg acaccatgca cacacacaag
                                                                       780
gtccacttct aggttttcag cctagatggg agtcgtgt
                                                                        818
      <210> 228
      <211> 746
      <212> DMA
      <213> Homo sapies
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                                                                       120
trgtggrega ertegeretet retegeretet thethaagan greggagtran albetaateg
                                                                       180
taggaasagt ggcttcgtaa satagsagag cagtcactgt ggaactacca satggcgaga
                                                                       240
tgctcggtgc acattggggt gctttgggat aaaagattta tgagecaact attctctggc
                                                                       300
accagattot aggocagett getocactga agottetece acagoagtoc acceetgeag
                                                                       360
grtggraget gaatggettg crggtggete tgtggraaga teacactgag ategatgggt
                                                                       420
gagaaggeta ggatgettgt etagtgttet tagetgteae gttggeteet teeaggttgg
                                                                       480
ccagacggtg ttggccactc cettetaaaa cacaggegee etcetggtga cagtgaceeg
                                                                       540
costastate cottescoca ticcascast cocastiate catiteaast tiggsettie
                                                                       600
ttettttegt taatgiteet eigigtigte ageigtette attieetggg eiaageagea
                                                                       680
ttgggagatg tggaccagag atccactect taagaaccag tggcgaaaga cactttett
                                                                       72D
cttcactctg aagtagctgg tggt
                                                                       744
      <210> 229
      <211> 300
      <212> DNA
      <213> Homo sapien
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cattacacat cgaaataaaa gaaaggtggc agacttgccc aacgccaggc tgacatgtgc
                                                                       120
tgcagggttg ttgtttttta attattattg ttagaaacgt cacccacagt coctgttaat
                                                                       180
tigtatgiga cagocaacto igagaaggic ctatittico accigoagag gatocagici
                                                                       240
cactaggete etecttgece teacactgga gtetecgeca gtgtgggtge ceactgaeat
                                                                       300
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      <211> 3D1
      <212> DNA
      <213> Homo sapien
      <400> 230
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gagcgacagt tcaaggagga gaagcttgca gagcagctca agcaagctga ggagctcagg
                                                                       120
caatataaag tootggttom caotoaggaa ogagagotga occagttaag ggagaagttg
                                                                       180
cgggaaggga gagabgcotc cototoattg aatgagcatc tocaggcoot cotcactccg
                                                                       240
gatgaacegg acaagteeca ggggG&GG&C etecaagaaa cagacetegg cegegaceae
                                                                       300
                                                                       3 D 1
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<210> 231
      <211> 301
      <212> DNA
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                                                                        БO
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                                                                       130
ggceacatgg gactteteat caggaagtgg gatgtagatg agetgatcaa gacggccagg
                                                                       180
totgaggatg graggatesa tgatgtragg reggttggts regreates tgssraratt
                                                                       240
tttttttgtg gacatgccat ccatttctgt caggatctgg ttgatgactc ggtcagcagc
                                                                      : 3DQ
                                                                       101
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      <211> 301
      <212> DNA
      <213> Homo sapien
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                                                                       120
agaagagtoc atotgotgtg aaggagagac agagaactot gggttoogto gtootgtoca
                                                                       180
Ogtgobgtac caagigoigg byccascoby tracetytic teactgaasa totggobaat
                                                                       240
getettätät ateaettetg attetgaesa teaateaate astggeetag ageaetgaet
                                                                       300
g
                                                                       301
      <210> 233
      <211> 301
      <212> DNA
      <213> Homo mapien
      c40D> 233
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                                                                        60
atgotaaggo cocagagato gtttgatoca accetettat tttcagaggg gaaaatgggg
                                                                       12D
cetagaagtt acagageate tagetggtgc gctggcacce etggcetcac acagaetece
                                                                       180
gagtagetgg gaetacagge acacagtese tgaagcagge cetgttagea attetatgeg
                                                                       240
tacaaattaa catgagatga gtagagactt tattgagaaa gcaagagaaa atcctatcaa
                                                                       300
                                                                       301
      <210> 234
      <211> 301
      <212> DNA
      <213> Homo gapien
aggicotaca catogagaci catocatgat igatatgaat itaaaaatta caagcaaaga
                                                                        δD
cattlifatto atcatgatgo titetitigt tictioniti egitticito titticitit
                                                                       120
traatttoag cascatactt otcaatttot toaggattta aaatottgag ggattgatot
                                                                       180
egecteatge cageaegtte eatgtttttg coerctgact gaacceette caggegtgce
                                                                       240
ttgatcacca gctteatggt cagatcatct gcttceatgg cttcgtcagt atagttcttc
                                                                       300
E
                                                                       301
      <210> 235
      <211> 283
      <212> DNA
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<213> Romo Bapien

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<400> 235
tggggetgtg catcaggogg gtttgagaaa tattoaatte teageagaag ecagaatttg
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                                                                        120
tgettteact aatgtetetg aacttetgte cetettegtt catggatagt ceaataaata
                                                                        180
atgitalcti tgaactgaig cicataggag agaatalaag aactcigagt gatatcaaca
                                                                        240
ttagggattc maagamatat tagatttaag ctcacactgg tca
                                                                        283
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      <211> 301
      <212> DNA
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astactitis astogatoag stitocotaa cocacatgos stottotica coagaagagg
                                                                        120
toggageage ateattaata eeaageagaa tgegtaatag ataaatacaa tggtatatag
                                                                        180
tgggtagacg gottoatgag tacagtgtac tgtggtatog taatotegac ttgggttgta
                                                                        240
sagcategtg taccagteag asagcatesa tactegacat gaacgaatat aasgaacace
                                                                        300
                                                                        IOE
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      <211> 301
      <212> DNA
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cagtggtagt ggtggtggac gtggcgttgg tcgtggtgcc ttttttggtg cccgtcacaa
                                                                        6 D
actorattle typicoclec tittiggest titecaritt piccateica attitetggg
                                                                        120
ccttggctaa tgcctcatag taggagtcct cagaccagcc atggggatca aacatatcct
                                                                       760
ttgggtagtt ggtgccaage tegteaatgg caeagaatgg ateagettet egtaaateta
                                                                       240
gggtteegaa attetttett eetttggata atgtagttea tateeattee eteetttate
                                                                       300
                                                                       301
      <210> 238
      <211> 301
      <212> DNA
      <213> Homo sapien
      5400> 238
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                                                                        60
gttcaceqtt cagcccctq ctcageaaec caacgggcca gcteeggaga ggaggaggca
                                                                       12D
cettgagaet teeggagteg aggeteteca gggtteecca geceateaat cattteetge
                                                                       180
accecutace taggaageas etecctaags sataasaata aataactasa aaggaattea
                                                                       240
gtgtgggacc cagggtctgt tcttcacagt aggaggtgga agggatgact aatttcttta
                                                                       300
t
                                                                       301
      <210> 239
      <211> 239
      <212> DNA
      <213> Homo sapien
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ttotgtoaaa coatgatact gagotttgfg acaacccaga aataactaag agaaggcaaa
                                                                       120
cataatacct tagagatosa gaaacattta cacagttosa otgtbiaaaa atagotosac
                                                                       180
attcagccag tgagtagagt gtgaatgcca gcatacacag tata¢eggtc cttcaggga
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<210> 240

<211> 300 <212> DNA <213> Homo sapien	
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<210> 241 <211> 301 <212> DNA <213> Homo gapien	;
<400> 241 gaggtetggt getgaggtet etgggetagg aagaggagtt etgtggaget ggaagedaga cetetttgga ggaaaeteca geagetatgt tggtgtetet gagggaatge aacaaggetg etectecatg tattggaaaa etgeaaaetg gaeteaaetg gaaggaagtg etgetgeeag tgtgaagaae eageetgagg tgaeagaaae ggaageaaae aggaaeagee agtettttet tectectect gteataeggt eteteteaag eateetttgt tgteagggge etaaaaggga g	60 12D 18D 240 300 301
<210> 242 <211> 301 <212> DNA <213> Homo sapien	
<400> 242 cogaggiret gggatgeac caateactet gitteaegig actitiatea ceatacaatt tgiggeatit ceteatitte tacattgiag aateaagagi giaaataaat giatategat gifteaaga ataateait ectititeen tagaareegi teaaaatata agicaagaat etiaatatea acaaatatat eaageaaact ggaaggeaga ataartaeea taatitagia taagtaeeea aagittiata aateaaaage eetaatgata accattitta gaatteaate a	50 120 180 240 300 301
<210> 243 <211> 301 <212> DNA <213> Komo sapien	
<400> 243 Aggtaagtee cagtttgaag etcaaagat etggtatgag cataggetea tegacgacat ggtggeecaa getatgaaat eagagggagg etteatetgg geetgtaaaa actatgatgg tgaegtgeag teggaetetg tggeecaaggg gtatggetet eteggeatga tgaecagegt getggtttgt eeagatggea agaeagtaga ageagagget geecaeggga etgtaaeeeg teaetaeege atgtteeaga aaggaeagga gaegteeaee aateeeattg etteeatttt t	60 120 180 240 300 301
<210> 244 <213> 300 <212> DWA <213> Homo sapien	
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```
ccagggacct Eggaaacagt tgacactgta aggtgcttgc tocccaagac acatcctaaa
                                                                        18 D
 aggigitgia aiggigaaaa ogicticcti cittatigce coltettatt taigigaaca
                                                                        240
 actgittgic tittgigiat offittiaaa ciglaaagit caatigigaa aatgaatato
                                                                        300
       <210> 245
      <211> 301
      <212> DNA
      <213> Homo sapien
      c400> 245
gtctgagtat ttaaaatgtt attgaaatta tccccaacca atgttagaaa agaaagaggt
                                                                         60
tatatactta gataaaaaat gaggtgaatt actatccatt gaaatcatgc tottagaatt
                                                                        120
aaggooagga gatattgtoa ttaatgtara ottoaggaca otagagtata goagooctat
                                                                        180
gttttcaaag agcagagatg caattaaata ttgtttagca tcaaaaaggc cactcaatac
                                                                        240
agetaatsaa sigaaagace taatitetas agesattett tataatitae aaagtittaa
                                                                        300
                                                                        101
      <210> 246
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 246
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                                                                         60
acctoggett attitaaaga actattigta geleagattig gitticetat geetaaaata
                                                                        120
agigetiett gigaaaatta aataasseag tiaatteasa geetigatat aigitaeeac
                                                                        180
taacaatcat actaaatata titigaagta caaagtiiga catgototaa agigacaaco
                                                                        240
canatytyto ttacacaca cyttoctaac aayytatyot ttacactacc aatycagaaa
                                                                       300
                                                                       301
      <210> 247
      <211> 301
      <212> DNA
      <213> Homo sapien
      c400> 247
aggirctitg gragggrica iggairagag ricasarigg agggasagge atticgggia
                                                                        é D
gectaagagg gegactggeg geageacaac caaggaagge aaggttgttt cecceacget
                                                                       12D
Statectate the against acacacate electages a cagateace catgegoing
                                                                       180
                                                                       240
cottgatgat caapgitigig gottaagigg attaagggag geaagitietg ggtteetige
cttttcasac catgaagtca ggctctgtat ccctcctttt cctaactgat attctaacta
                                                                       300
                                                                       301
      <210> 248
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 248
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attaggaaga ttcttagggg taatttttct gaggaaggag aactagccaa cttaagaatt
                                                                       120
acaggaagaa agtggtttgg aagacagcca aagaaataaa agcagattaa attgtatcag
                                                                       18D
gtacatteca geetgttgge aactecataa aaacatttea gattttaate eegaatttag
                                                                       24 D
ctaatgagac tggatttttg ttttttatgt tgtgtgtege agagetaaaa acteagttee
                                                                       300
                                                                       301
      c210> 249
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<211> 301

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<212> DNA
      <213 > Homo capien
       <400> 249
gtrcagasga agcacctggt grtgaactag grttgrretg etgtgaartt scarttggag
                                                                        60
ecctgaeget getgttetee eegaaaaaee egaegaeet eegegatete egteeegeee
                                                                       12D
ccaggyagae acageagtga cteagagetg gtegeaeact gtgeeteect ceteaeegee
                                                                       180
catcytaatg aattattttg aaaattaatt ccaccatcct ttcagattct ggatggaaag
                                                                       240
actgaatett tgacteagaa ttgtttgetg aaaagaatga tgtgaettte ttagteattt
                                                                       ጎርር
                                                                       301
      <210> 250
      <211> 301
      <212> DNA
      c213> Homo sapien
      <400> 250
sgtotstgae aassacttge assotstsss assoastsa coettaacae tacaettete
                                                                        60
cttatctta tiggetigat esecateatt attictaaca ctegettatt tecegtigee
                                                                       120
cataagcaca toagtacttt tototggotg gaatagtaaa otaaagtatg gtacatotac
                                                                       190
ctaaaagact actatgtgga ataatacata ctaatgaagt attacatgat ttaaagacta
                                                                       240
Caataaaacc aaacatgett ataacattaa gaaaaacaat aaagatacat gattgaaacc
                                                                       300
                                                                       301
      <210> 251
      <211> 3Q1
      <212> DNA
      <213> Homo sapien
      <400> 251
geogaggice tacatitigge coagitions origeatest elecaggics ecigesteat
                                                                        60
agacaacete atagageata ggagaactgg ttgeeetggg ggeagggggga etgtetggat
                                                                       120
99009999t0 Ctcaaeaaty coactytoac tyccayyaea tycttotyay caytacacct
                                                                       160
cattgggate aatgaaaage ttesagaaat etteaggete actetettga aggeeeggaa
                                                                       240
cototggagg ggggcagtgg aatoccagot ccaggacgga tootgtogaa aagatatoot
                                                                       300
                                                                       301
      <210> 252
      <211> 301
      <212> DNA
      <213> Romo capien
      <400> 252
granceaste setetyttte acytesettt tateaceata easttigtgy cattiectes
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                                                                       120
tcattccttt ttcactagga acccattcaa aatataagtc aagaatctta atatcaacaa
                                                                       180
atatateaag caaactggaa ggcagaataa ctaecataat ttagtataag taeccaaagt
                                                                       240
tttataeatc eaaagcccta atgataacce tttttageet tcaatcatca ctgtageatc
                                                                       300
                                                                       301
      c210> 253
      <211> 301
      <212> DNA
      <213> Momo sapien
      <400> 253
Etcoctaaga agatgitatt tigtigggit tigttococc tocalctoga tictogtaco
                                                                       60
CASCLARARA ARBARANTAR AGRARANTA TO TRANSPORT ARCTITUDE CONTRACT
                                                                       120
```

```
tygtotgatt gitticagae ettaaaatat aaacttytti cacaagetti aatecatgig
                                                                        180
                                                                        240
gatttittt cttagagaac cacaaaacat aaaaggagca ägtoggäetg aatacctgtt
treatagige ceacagggta titectearat titeterata ggaaasigei litteecaag
                                                                        300
                                                                        301
      <210> 254
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 254
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aacttgacca attoccttga agogggtggg ttaaaccctg taaatgggaa caaaatcccc
                                                                        120
ccaestatat testattaca ctggtggact catgeotgte geettttttg gttgesecae
                                                                        180
gaaaaaaata aagettigga ettiteaagg tigettaaca ggtaetgaaa gaetggeete
                                                                        240
acttaeactg ageoaggeaa agetgeeget ttattaatgg gtgtgttagt gtgcagtgce
                                                                        300
                                                                        301
      <210> 255
      <211> 302
      <212> DNA
      <213> Homo sapien
      c400> 255
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attactgasa tgtttctttt ctgaatatas atatsaatat gtgcasagtt tgacttggat
                                                                       120
tgggattttg ttgagttett caagcatete etaataceet caagggeetg agtagggggg
                                                                       180
aggaaaaagg actggaggtg gaatctttat aaaaaaccaag agtgattgag gcagattgta
                                                                       240
abcattatta saaaacasga ascaascaas asaatagags asaasaccac cccaacacac
                                                                       30D
                                                                       302
      <21Q> 256
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n - A,T,C or @
      <400> 256
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                                                                        60
aggaccetec tecceacace teaatecace maaccateca tmatgemeer agataggeen
                                                                       12D
acceccasaa geetggacae ettgageaca esgttatgae eaggacagae teatetetat
                                                                       100
aggeaaatag etgetggeaa aetggeatta eetggtttgt ggggatgggg gggeaagtgt
                                                                       240
                                                                       300
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                                                                       301
      <210> 257
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 257
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                                                                        60
tecceactta tittigiett teactatege aggeettaga agaggietae etgectecag
                                                                       120
tettacetag tecagtetae eccetggagt tagaatggee atectgaagt gaaaagtaat
                                                                       180
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gteacattae tecetteagt gatttettgt agaagtgeen atecetgaat gecaccaaga
                                                                        240
tottaatott cacatottta atottatoto titgactoot otttacaccy gagaaggoto
                                                                        300
                                                                        301
      <210> 258
       <212> 301
       <212> DNA
      <213> Homo papien
      <22D>
      <221> misc_feature
      <222> (1) ... (301)
      <223> n - A,T,C or G
      <400> 258 1
cagoagtagt agatgoogta tgooagcacg cocagoacte coaggateag caccagoace
                                                                         60
aggggcccag ccaccaggcg cagaagcaag ataaacagta ggctcaagac cagagccacc
                                                                        120
cccagggcaa caagaatcca ataccaggac tgggcaaaat cttcaaagat cttaacactg
                                                                        180
atgictoggg cattgagget gicaataana ogcigatocc cigotgiatg giggigicat
                                                                        240
typtyatece typpayegee ggtegagtaa egttygteea typeaageag cycecacac
                                                                       300
                                                                       301
      <210> 259
      <211> 301
      <212> DNA
      <213> Homo Bapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 259
toatatatgo aaacaaatgo agactangoo toaggoagag actaaaggae atotottggg
                                                                        БO
ptgtoctama gtgetttgge cocctaeggg cegaceccte egteggeetc ccegtggeen
                                                                       120
gennageent naggaageee aggatteett gigateagga agigggeeag gaaggieigi
                                                                       180
tecageteae ateteatety catgeageae ggaceggaty egeceaetgg gtettggett
                                                                       240
coctcocate ttetcaagea gtgtcettgt tgagecattt geatecttgg ctccaggtgg
                                                                       300
C
                                                                       301
      <210> 260 ⋅
      c211> 301
      <212> DNA
      <213> Homo sapien
      <400> 260
tttttttttt ecctaaggaa aaagaaggaa caagteteat aaaaceaaat aageaatggt
                                                                        60
eaggtgtctt aactigasaa agattaggag tcactggtit acaagitata attgaatgaa
                                                                       120
agaactgtes regereagt tggccatttr atgcreatgg cagraeacae caggattaac
                                                                       180
tagggcaaaa taaataagtg tgtggaagcc ctgataagtg cttaataaac agactgattc
                                                                       240
actgagacat cagtacetge eegggeggee getegageog aattetgeag atatecatea
                                                                       300
C
                                                                       301
      <210> 261
      <211> 301
      <212> DNA
      <213> Homo sapien
```

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<400> 251
 asstattega geaaateetg taactaatgt gteteestas asggettigs acteagtgaa
                                                                         60
 telgetteea tecacgatte tageaatgae eleteggaea teaaagetee tettaaggtt
                                                                        120
agcaccaact attccataca attcatcage aggaaataaa ggetetteag aaggtteaat
                                                                        180
ggtgacatcc aatttcttct gataatttag attcctcaca accttcctag ttaagtgaag
                                                                        240
ggoatgatga teatecaaag cecagtggte acttacteca gaetttetge aatqaaqate
                                                                        300
                                                                        301
      c210> 262
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 262
9a99a9a9cc tgttacagca tttgtaagca cagaatactc caggagtatt tgtaattgtc
                                                                         60
Egigagette tigeogeaag teteteagaa attiaaaaag aigeaaaice eigagicaee
                                                                        120
cctagaette ctasaccaga tectetgggg ctggaacetg geactetgea tttgtaatga
                                                                        120
gggetttetg gtgcacacct aattitgtgc atcittgccc taxatcctgg attagtgccc
                                                                        24 D
catcattace eccacattat aatgggatag atteagagea gatactetee agcaaagaat
                                                                        30D
                                                                        301
      <210> 263
      <211> 301
      <2125 DNA
      <213> Homo sapien
      <220>
      <221> misc_festure
      <222> (1) ... (301)
      <223> n = A, T, C or G
      <400> 263
tttagottgt ggtaaatgac tcacaaact gattttaaaa tcaagttaat gtgaattttg
                                                                        δD
aaaattacta ottaatoota attoacaata acaatggoat taaggtttga ottgagttgg
                                                                        120
ttottageat battlatggt asataggoto ttaccapttg casatsactg gccacabcat
                                                                        180
taatgactga etteccagta aggeteteta aggggtaagt angaggatee aeaggatttg
                                                                        24 D
agatgotaag gooccagaga togitigato caacoototi attitoagag gggaaaatgg
                                                                       300
                                                                        301
      <210> 264
      <211> 301
      <212 > DNA
      <213> Homo sapien
      <400> 264
Assystytta ascentita chaccactly togasetete assyggiass tysessassee
                                                                        60
Astgastgas tetaasaaca stattaest tteatggttt gtagasaata saasaacaag
                                                                       120
gtggatagat ctagaattgt aacattttaa gaaaaccata acatttgaca gatgagaaag
                                                                       180
ctcaattata gatgcaaagt tataactaaa ctactatagt agtaaagaaa tacatttcac
                                                                       240
accetteata taaatteact atettggett gaggeactee ataaaatgta teaegtgeat
                                                                       3QB
                                                                       301
      c210> 265
      c211> 301
      <212> DNA
      <213> Homo sapien
     <400> 265
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tgcccmagtt atgtgtaagt cttcttgtgm cgcagtattt catattcttg gaagtctcta ttttcagttt gtcaacatgt cagtccaagg ctttgacatg c	cttctctggg atcaactttt tctctaacaa	gagaagcegg gttccatttg cacttgccca	gaagtettet ttteatttet tttetgtaaa	cetggeteta teaggaggga gaatecaaag	60 120 180 240 300 301
<210> 266 <211> 301 <212> DNA <213> Homo sapie	n.				;
<400> 266 taccgtotgo cottoctoco acaccagato actottoct ctottotgtg ttccagetto atagagacae caatacccat cacagactee tgacaactgg a	ctacccacag ttttcctgtt aacctctctc	gettgetatg etteccacee ctaageetee	agcaagagac cttaagttct ttataaccca	acaaceteet atteetgggg gggtgeacag	60 120 180 240 300 301
<210> 267 <211> 301 <212> DNA <213> Homo Bapie	n				
<pre>&lt;400&gt; 267 aaagagcaca ggccagetca gtteteagtg etgagteeat atecteacag geagettetg cteattetga tteeteret aattegette agettgtetg t</pre>	ccaggaaaag agagcctgat tcttttettt	otcacctaga attectagec caagttggct	ccttctgagg ttgatggtet ttcctcacat	otgaatotto ggagtaaago coctotgtto	60 120 180 240 300
<210> 268 <211> 301 <212> DNA <213> Homo gapie:	n				301
<pre>&lt;400&gt; 268 aatgtotoac toaactactt c gatchtggga gagetggthe l togaagagga agtotaatgg a tgotgggtgg otoagtgage c cttoccattg ttotacttte l a</pre>	ttekanggag aagtaattag cottbtggag	eaggeggeeg tcaacggtcc aaagcaagta	garagatgta ttgtttagac ttattcttaa	actttggatc tcttggaata ggagtaacca	50 120 180 240 300 301
<210> 269 <211> 301 <212> DNA <213> Homo sapie	p				
<pre>&lt;400&gt; 269 taacaatata cactagctat c aaaattacct ttattcacac a atagtcacag accttaaata i ctttctgga tattctttac c tacagtagca caaccacctt a t</pre>	ateteaaaae tteaeattgt maamtettat	aattotgosa tttotatgto taaaattoot	attettagtg tactgaaaat ggtattatca	aagtttaact aagttcacta cccccaatta	50 120 180 240 300 301

120

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<210> 270
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 270
 cattgaagag cttttgcgaa acatcagaac acaagtgctt ataaaattaa ttaagcctta
                                                                         БÔ
 cacaagaata catatteett ttatttetaa ggagttaaac atagatgtag etgatgtgga
                                                                        120
 seguited gtgcegtgce teltggates cartetivet ggccgesite atceagicae
                                                                        180
 ccanctcctt gasctggatc atcagaagaa gggtggtgca cgatatactg cactagatas
                                                                        240
 tggaccaacc asctaaattc tctcaccagg ctgtatcagt aaactggctt aacagaaaac
                                                                        300
                                                                        301
       <210> 271
       <211> 301
       <212> DNA
       <213 > Homo sapien
       <220>
      <221> misc_feature
       <2225 [1]...(301]
      <223> n = A,T,C or G
      <400> 271
assaggitet catasgatta acsattiass taastattig atagescatt cittotestt
                                                                         60
tttatagete atetttaggg ttgatattea gtteatgett ceettgetgt tettgateca
                                                                        120
gaartgeaat caetteatea geetgtatte geteeaatte tetafaaagt gggteeaagg
                                                                        180
tgaaccacag agocacages cacetettte cettggtgae tgeetteace ceatganggt
                                                                        240
tetetectee agatgamaac tgateatgeg cecacatttt gggttttata gaageagtea
                                                                        300
C
                                                                        EGE
      <210> 272
      <211> 301
      <212> DNA
      <213> Homo sapiem
      <400> 272
taaattgcta agccacagat aacaccaatc aaatggaaca aatcactgte ttcaaatgte
                                                                        60
ttatoagaaa accaaatgag cotggaatot toataataec taaacatgee gtatttagga
                                                                       120
ternateatt creteatgat gagenagana nattettige genecettee tgenternen
                                                                       180
geatettete caacaaatat aacettgagt ggettettgt aatetatgtt etttgtttte
                                                                       240
ctaaggactt ccattgcatc tectacaata tittetetac gcaccactag aattaagcag
                                                                       300
                                                                       301
      <210> 273
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...(301)
      <223> n = A,T,C or G
      <400> 273
acatglglgt atglgtatct ttgggaaaan aanaagacat cllgtllayk attlttttgg
                                                                        60
agagangetg ggacatggat aatcacwtaa tttgctayta tyactttaat ctgactygaa
```

```
gaacogteta aasataaaat ttaccatgte Statatteet tatagtatge ttattteace
                                                                        180
ttytttetgt eeagagagag tateaqtgae ananatttma gggtgaamae atqmattqgt
                                                                        240
gggacttnty tttacngagm accobgoog spegeceteg makengantt cegesanane
                                                                        300
                                                                        301
      <210> 274
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> {1}...(301)
      <223> n = A,T,C or G
      <400> 274
cttatatact ctttctcaga ggcasaagag gagatgggta atgtagacaa ttctttgagg
                                                                        60
dacagtadat gattattaga gagaangdat ggaccaagga gacagaadtt dacttgtada
                                                                       120
tgattctctt tggaatctga atgagatcaa gaggccagct ttagcttgtg gaaaagtcca
                                                                       180
totaggtatg gttgcattot ogtottottt totgcagtag ataatgaggt aaccgaaggo
                                                                       240
aattgtgett ettttgataa gaagetttet tggteatate aggaaattee aganaaagte
                                                                       300
                                                                       301
      <210> 275
      <211> 301
      <212> DNA
      <213> Homo sapien
      c220>
      <221> misc feature
      <222> (1) ... (301)
      <223> n = A,T,C or G
      <400> 275
teggisteas cascaestes catteaacat tscaatetes ascecaace acasaaate
                                                                        60
gggtgaaatt ggccaacttt ctattaactt atgttggcaa ttttgccacc aacagtaagc
                                                                       120
tggcccttct aataaaagaa aattgaaagg tttctcacta aacggaatta agtagtggag
                                                                       180
traagagant creaggrets agogtarcty cregggrege cyctegaage cgaattetge
                                                                       24Q
agatatecat cacactggeg gnegetegan catgoateta gaaggneeaa ttegecetat
                                                                       300
                                                                       301
      <210> 276
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 276
tgtacacate ctceateest esatgactgc attgtggtst tattactata ctgettatet
                                                                        60
ttatcatgtg acttctaett egasaatgte tccassegce esscagcega tataceasst
                                                                       120
taaagagaca gaagatagac attaacagat aaggcaactt atacattgag aatccaaatc
                                                                       180
Caatacattt aaacatttgg gaaatgaggg ggacaaatgg aagccagatc aaatttgtgt
                                                                       240
asaactatto agtatgitto cottgottoa tgtotgagaa ggoteteett caatggggat
                                                                       300
                                                                       301
      <210> 277
      <211> 301
      <212> DNA
      <213> Homo sapien
```

```
<220>
        <221> misc_feature
        <222> {1}...(301)
        <223> n = A,T,C or G
        <400> 277
 tttgttgatg tragtatttt attacttgrg ttatgagtgo tcacctggga aattotaaag
                                                                          60
 atacagagga cttggaggaa gcagagcaac tgsatttaat ttaaaagaag gaasacattg
                                                                         120
 gaateatgge actectgata ettteccaaa teaacaetet caatgeecca cectegteet
                                                                         180
 caccataging gragaciaa agingcoach gaitingcett angintega incontra
                                                                         240
 gttenetate gattacatet gaccagtete ettttteega agteenteeg tteaatettg
                                                                         300
                                                                         301
       <210> 278
       <211× 301
       <212> DNA
       <213> Homo mapien
       <220×
       <221> misc_feature
       <222> (1)...(301)
       <223> n = A, T, C \text{ or } C
       <400> 278
 taccactaca etecageety gycaacagag caagacetyt eteaaageat aaaatggaat
                                                                         60
 aecatatesa atgasacegg gasaatgaag etgaceattt atggsagees gggettgtes
                                                                        1.50
 cagtetetae tgttattatg cattacrtgg gaatttatat aageerttaa taataatges
                                                                        7BO
 aatgaacate teatgtgtge teacaatgtt etggeactat tataagtget teacaggttt
                                                                        240
 tatgtgttet tegtaacttt atggantagg tacteggeeg egaacaeget aageegaatt
                                                                        300
                                                                        301
       <210> 279
       <211> 301
       <212> DNA
       <213> Homo sapien
      <220×
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A,T,C or C
      <4D0> 279
aaagcaggaa tgacaaagct tgcttttctg gtatgttcta ggtgtattgt gacttttact
                                                                         60
gttatattaa ttgccaatat aagtaaatat agattatata tgtatagtgt ttcacaaagc
                                                                        120
ttagacettt acetteeage eacceeacag tgettgatat tteagagtea gteattggtt
                                                                        180
atecetytyt agttomaag medataegot agaanaanaa atattomag ggagoactao
                                                                        240
catctgtttt cacatgaaat gccacacaca tagaactcca acatcaattt cattgcacag
                                                                        300
                                                                       302
      <210> 280
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 280
ggtactggag tittcciccc cigigaaaac gtaactacig tigggagiga aitgaggaig
                                                                        6Q
togazaggtg gtggaaccaa allgtgglca alggazatag gagaztalgg tictcactol
                                                                       120
```

tgagaaaaaa acctaagatt agcccaggta gttgcctgta acttcagttt ttctgcctgg gtttgatata gtttagggtt ggggttagat taagatctaa attacatcag gacaaagaga cagactatta actccacagt taattaagga ggtatgttcc atgtetattt gttaaagcag t	240
<210> 281 <211> 301 <212> DNA <213> Homo sapien	
<400> 281 aggtaczaga aggggaatgg gazagagotg otgotgtgge attgttcaze ttggatatte aggtaczaga aggggaatgg gazagagotg otgotgtgge attgttcaze ttggatatte geogagozat ccaaatectg aatgagggg catcttetga aaaaggagat ctgaatetga atgtgtage aatggcttta tegggttata eggatgagas gazetecett tggagagasa tgtgtageae actgegatta ezgetazata accegtattt gtgtgteatg tttgeattte tgzecagtga azaczazgtt geogtacete gg	180 240
<210> 202 <211> 301 <212> DNA <213> Homo sapien	
c400> 292  caggtactac agaattaaaa tactgacaag caagtagttt cttggcgtgc acgaattgca tccagaaccc asaasttaag aaattcaasa agacattttg tgggcacctg ctagcacaga agogcagaag caaagcccag gcagaaccat gctaacctta cagctcagcc tgcacagaag cgcagaagca aagcccaggc agaaccatgc taaccttaca gctcagcctg cacagaagcg cagaagcaaa gcccaggcag aacatgctaa ccttacagct cagcctgcac agaagcacag a	180 180 240
<210> 283 <211> 301 <212> DNA <213> Romo sapien	
<400> 283 atotgtatac ggcagacaaa ottiatarag tgtagagagg tgagogaaag gatgcaaaag cactttgagg gotttataat aatatgotgo ttgaaaaaaa aaatgtgtag ttgatactca gtgcatotoo agacatagta aggggttgot otgaccaato aggtgatoat tittitotato acttoocagg tittatgcaa aaattitgtt aaattotata atggtgatat gcatottta ggaaacatat acattttaa aaatctatt talgtaagaa ctgacagacg aatttgottog	120 190 240
<210> 284 <211> 301 <212> DNA <213> Homo sapien	
<400> 284 caggtacaaa acgetattaa gtggettaga atttgaacat ttgtggtett tatttaettt gettegtgtg tgggeaaage aacatettee etaaatatat attaccaaga aaageaagaa geagattagg tttttgacaa aacaaacagg ecaaaagggg getgaeetgg ageagageat ggtgapagge aaggeatgag agggeaagtt tgttgtgac agatetgtge etactttattactgaetggagtaa aagaaaacaa agtteattga tgtegaagga tatatacagt gttagaaatta a	120 180 240

<210> 285

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<211> 301
        <212> DNA
        <213> Komo sapien
        <220>
        <221> misc_feature
        <222> (1)...(301)
        <223> n = A,T,C or G
        <400> 285
 acatoacoat gatoggatoc cocacocatt atacgttgta tgtttacata aatactctto
                                                                          ٤ũ
 astgatcatt agtgttttas assasstant gassactert tetgesteer astetetase
                                                                        120
 caggaaagca aatgctattt acagacotgo aagcootcoo toaaacmaaa ctatttotgg
                                                                         180
 attacatatg tetgaettet tttgaggtea caegaetagg caaatgetat ttacgatetg
                                                                         240
 casaagetgt ttgaagagte asageceees tgtgsseneg atttetggse eetgtaacag
                                                                         300
                                                                         301
       <210> 286
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 286
 taccaetgca ttccageetg ggtgacagag tgagacteeg tetecaaaaa aaactttget
                                                                         60
 tgtatattat ttttgcctta cagtggatca ttctagtagg aaaggacagt aagattttt
                                                                        120
 atcaaaatgt gtcatgccag taagagatgt tatattettt tetesttett tecesaceea
                                                                        180
 assatsaget accatstage tratasgret essatttttg cetttaeta sestgigstt
                                                                        240
 gtttctgttc attgtgtatg cttcatcacc tatattaggc azattccatt ttttcccttg
                                                                        300
                                                                        301
       <210> 287
       <211> 301
       <212> DNA
       <213> Homo gapien
       <400> 287
tacagatetg ggaactaaat attaaaaatg agtgtggetg gatatatega gaatgttggg
                                                                         60
cccagaagga acgtagagat cagatattac aacagctttg ttttgagggt tagaaatatg
                                                                        120
asatgatttg gttatgaacg cacagtttag gcagcagggc cagaatcctg accetetgec
                                                                        180
cogragatian electrocca geriggerae eleatgital cacagitatic cartifitti
                                                                        340
gttgcatgte ttgtgaagee atcazgattt tetegtetgt ttteetetea tiggtaatge
                                                                        300
                                                                        301
      <210> 288
      <211> 301
      <212> DNA
      <213> Nomo sapien
      <400> 288
gtacacctaa ctgcaaggac agctgaggaa tgtaatgggc agccgctttt aaagaagtag
                                                                        60
agtoxatagg aagacxaatt ocxyttocag ctoagtotgg gtatotgcax agotgcaaax
                                                                       120
gatetttaaa gaesatttes agagaatatt teettaaagt tggesatttg gagatestae
                                                                       180
Assageatet gettttgtgs tttsatttag etestetgge esetggsags atceasacag
                                                                       24D
tetgeettaa tittggatga atgeatgatg gaaatteaat aatttagasa gitaaasaaa
                                                                       30D
                                                                       301
      <210> 289
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<211> 301

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<212> DNA
      <213> Homo sapien
      <220>
      <221> misc feature
      <222> (1),..(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 289
ggtacactgt ttocatgtta tgtttotaca cattgctace tcagtgctcc tggaaactta
                                                                          60
gettttgatg teteraagta gteracette atttaactet tigaaactgt atcatettig
                                                                         120
ccaagtaaga gtggtggcct atticagctg ctitgacaaa atgactggct cctgacttaa
                                                                        18D
cgttctataa atgaatgtgc tgaagcaaag tgcccatggt ggcggcgaan aagagaaaga
                                                                         240
tgtgttttgt tttggactet etgtggtece ttecaatget gtgggtttee aaccagngga
                                                                         300
                                                                         301
      <210> 290
      <211> 301
      <212> DNA
      <213> Homo sapien
      c220>
      <221> misc_feature
      <2225 (1)...(301)
      \langle 223 \rangle n = A,T,C or G
      <400> 290
acactgaget ettettgata aatatacaga atgettggca tatacaagat tetatactac
                                                                          60
tgactgatet giteatitet eteacagete tracecceaa aagetittee accetaagig
                                                                         120
tectgaccto ottitotaat caragiaggg atagaggcag ancoacctac aatgascatg
                                                                       . 180
gagttotato aagaggoaga aacagoacag aatoocagtt ttaccattog ctagoagtgo
                                                                         240
tgccttgaac aaaaacattt ctccatgtct cattttcttc atgcctcaag taacagtgag
                                                                         300
                                                                         301
      <210> 291
      <211> 301
      <212> DNA
      <223> Homo mapien
      <400> 291
                                                                          G٥
caggiarcae titritichet rotagesers titretitta igiigitges ecatesreer
                                                                         120
tatateaget agattttttt tetatgettt acetgetatg gaaaatttga cacattetge
tttactcttt tgtttatagg tgaatcacaa aatgtatttt tatgtattct gtagttcaat
                                                                         180
agecatgget gtttacttca titaatttat ttagcataaa gacattatga aaaggediaa
                                                                         240
acatgagett cartteeres ctaartaatt ageatetgtt atttettaac egtaatgeet
                                                                         300
                                                                         301
      <210> 292
      <211> 301
      <212> DNA
      <213> Homo sapien
      <22D>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 292
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accttttegt agtastgict aataataast aagaaatcaa tittataagg tooatatagc
                                                                          бD
 tgtattaaat aatttttaag tttaaaagat aaaataccat cattttaaat gttggtattc
                                                                         120
 aaaaccaaag natataaccg aaaggaaaaa cagatgagac ataaaatgat ttgcnagatg
                                                                         190
 ggaaatatag tasttyatga atgttnatta aatteeagtt ateatagtgg etacacacte
                                                                         240
 Ecactacaca cacagaccoc acagicotat algocacasa cacatitica taactigaas
                                                                         300
                                                                         301
       <210> 293
       <211> 301
       <212> DNA
       <213> Homo sapien
       <400> 293
 99taccoagt got99tgcca goot9ttaco tgttctcact gaaaagtctg gctaatgctc
                                                                         60
 ttgtgtagte acttctgatt ctgacaatca atcaatcaat ggcctagage actgactgtt
                                                                        120
 aacacaaacg tcactagcaa agtagcaaca gotttaagto taaatacaaa gotgttotgt
                                                                        180
 gtgagaattt tttaaaagge taettgtata ataaccettg teatttttaa tgtaeetegg
                                                                        240
 ccycyaccar grtaagccya attrigraga taloralcar ariggcygcc gricyagcat
                                                                        300
 q
                                                                        301
      <210> 294
      <211> 301
      <212> DNA
      <213> Homo sapien
      c220>
      <221> misc feature
      <222> (1)...(301)
      <223> n = A, T, C or G
      <400> 294
tgacccataa caatatacac tagctatett tttaactgte catcattage accaatgaag
                                                                         60
attomatasa attaccetta tecacacate tomasacast totgomastt ottagtgmag
                                                                        120
titaactata gicacagane tiaaatatte acatigitti etaigietae igaaaataag
                                                                        180
ttcactactt ttctgggata ttctttacaa aatcttatta aaattcctgg tattatcacc
                                                                        240
cocanttata dagtagoaca accaecttat gtagttttta catgataget otgtagaggt
                                                                        300
t
                                                                        3 D 2
      <210> 295
      <211> 305
      <212> DNA
      <213> Homo sapien
      <400> 295
gtactctttc tetecectec tetgaattta attettteaa ettgeaattt geaaggatta
                                                                        60
cacatttcac tytgatytat attytyttyc aasaaaaaaa ytytetttyt ttaaaattac
                                                                       120
ttggtttgtg aatcoatctt gettttteec cattggaact agteattaac ceatetetga
                                                                       180
actsstagaz azzertetga agagetagte tateagezte tgacaggtgz attggatggt
                                                                       240
totoxgaaco atttoxocox gacagootgt ttotatoctg tttaataaat tagtttgggt
                                                                       300
tetet
                                                                       305
      <210> 296
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 296
agginetatg ggangetget aaantantat tigatagiaa aagiatgiaa igigetatet
                                                                        6 D
```

```
cacctagtag tasactaasa ataaactgaa actttatgga atctgaagtt attttccttg
                                                                       120
attaaataga attaataaac caatatgagg aaacatgaaa ccatgcaatc tactatcaac
                                                                       180
titgaaaaag tgatigaacg aaccacttag ctitcagatg atgaacactg ataagtcatt
                                                                       240
tgtcattact ataaxtttta asatctgtta ataagatggc ctatagggag gasaaagggg
                                                                       300
                                                                       301
      <210> 297
      <211> 300
      <212 DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(300)
      <223> n = A,T,C or G
      <400> 297
                                                                        60
actgagtttt mactggacge emagemggem mggetggmmg gttttgebet etttgtgetm
aaggttttga aaacettgaa ggagaatcat tttgacaaga agtacttaag agtctagaga
                                                                       120
acaaagangt gaaccagotg aaagototog ggggaanott acatgtgttg ttaggootgt
                                                                       180
tecateattg ggagtgeact pgecatecet caaaatttgt etgggetgge etgagtggte
                                                                       240
acogcacete ggeegegaee aegetaagee gaattetgea gatateeate acaetggegg
                                                                      . 300
      <210> 298
      <211> 301
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...(301)
      <223> n = A,T,C or G
      <400> 298
                                                                        60
tatggggttt gtcacccaaa agctgatget gagaaaggee teectgggge coccecogeg
ggcalrigag agacciggig ticcagigtt triggaaatg ggtcccagig ccgccggctg
                                                                       120
                                                                       180
tgaagetete agateaatea egggaaggge etggeggtgg tggeeaeetg gaaeeaeet
gtootgtotg titacattto actaycaggt titototggg cattacnatt tgitcoccta
                                                                       240
caacagtgac ctgtgcattc tgctgtggcc tgctgtgtct gcaggtggct ctcagcgagg
                                                                       300
                                                                       301
      <210> 299
      <211> 301
      <212> DNA
      <213> Homo mapien
      <400> 299
                                                                        60
gttttgagae ggagttteae tettgttgee cagactggae tgeaatggea gggtetetge
trantgrade ctetgrette raggittegag raattetest gretragest recaggings
                                                                       120
tgggattgca ggctcacgcc accataccca gctaattttt ttgtattttt agtagacg
                                                                       180
                                                                       240
qaqtttcqcc atqttqqcca qctqqtctca aactcctgac ctcaagcgac ctgcctgcct
cggcctccca aagtgctgga attataggca tgagtcaaca cgcccagcct asagstattt
                                                                       300
                                                                       3D1
      <210> 300
      <211> 301
      <212> DNA
      <213> Homo sapien
```

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<400 > 300
  attoagtttt atttgotgoo coagtatotg taaccaggag tgocscaaaa tottgocaga
                                                                           60
  tatgteceae acceaetggg aaaggeteee acctggetae tteetetate agetgggtea
  gotgeattee acaaggitei cageetaatg agitteacta cotgecagie teaaaactia
                                                                          120
                                                                          180
  gtaaagraag accatgacat tooccepacgg aaatcagagt ttgccccace gtottgttac
                                                                          240
  taleasgect goototaada gtoottgott ottoocacea atoocgageg cateccocat
                                                                          300
                                                                          301
        <210> 301
        <211> 301
        <212> DMA
        <213> Homo sapien
        <400> 301
  ttaaatiltt gagaggataa aaaggacaaa taalitagaa atgigtette licagietge
                                                                          60
  agaggacecc aggtetecaa geaaceacat ggtemaggge atgaataatt aamagteggt
                                                                         120
  gggaacteac aaagaccete agagetgaga caceeacaac agtgggaget cacaaagace
                                                                         180
  ctdagagetg agacaeccae aacagtggga geteacaaag acceteagag etgagacaec
                                                                         240
 cacaacagca cotegiticag etgecacatg tgtgaataag gatgeaatgt coagaagtgt
                                                                         300
                                                                         301
       <210> 302
       <211> 301
       <212> DNA
       <213> Homo sapien
       <4D0> 302
 aggtacacat ttagettgtg gtaaatgaet cacaaaaetg attttaaaat caagttaatg
 tgaattttga aaattactac ttaatcctaa ttcacaataa caatggcatt aaggtttgac
                                                                         60
 tigagitiggi tettagtatt atttatggta sataggetet taccactige aastaactgg
                                                                        120
 ccacatratt aatgactgac ttcccagtaa ggctctctaa gggggtaagta ggaggatcca
                                                                        190
                                                                        240
 caggatitga gatgetaagg coccagagat cytttgatec aaccetetta titteagagg .
                                                                        300
                                                                        301
       <210> 301
       <211> 301
       <212> DNA
       c213> Homo sapien
       <400> 303
aggtaccaac tgtggaaata ggtagaggat cattttttct ttccatatca acteagttgt
                                                                         60
atattgtttt ttgacagttt aacacatett ettetgteag agattettte acaatageae
                                                                        120
tggctaatgg aactacogct tgcatgttaa aaatggtggt ttgtgaaatg atcataggcc
                                                                        180
agtaacoggt atgittitet aactgatett tigelegite caaaoggace teaagactte
                                                                        240
categattit atatetgggg tetagasaag gagttaatet gtttteeete ataaatteae
                                                                        300
                                                                        301
      <210> 304
      <211> 301
      <212> DNA
      <213> Homo sapien
      <400> 304
acatggatgt tattttgcag actgtcaacc tgaatttgta tttgcttgac attgcctaat
                                                                        60
tattagette agttteaget tacceaettt tigtetgeaa catgearaas agacagtgee
                                                                       120
ctitttagtg tatcatatea ggaatcatet cacattggtt tgtgccatta ctggtgcagt
gactttrage carttgggta aggtggagtt ggccatatgt ctccartgca aaattactga
                                                                       180
                                                                       240
```

```
300
Ettecottit gcaattaata agigtgigtg igaagattoi tigagaigag giatatatot
                                                                       301
      <210> 305
      <211> 301
      c212> DNA
      c213> Homo sagien
      <220≻
      <221> misc_feature
      <222> {1}...(301)
      c2235 n = A,T,C or G
      <400> 305
                                                                        бO
gangtacage giggicaagg taacaagaag aasaaaatgi gagiggcate cigggalgag
cagggggana gacntggana ganacgttgt natttgenge tglgggtagg aasatgggng
                                                                       120
taaaggagga gasacagata caaaatctcc aactcagtat taaggtattc tcatgcctag
                                                                       180
aatattegta gaaacaagaa tacattcata tgecaaataa ctaaccatge tegaacaaaa
                                                                       240
ttotgggatt taagttggat accaangaaa ttgtattaaa agagetgtte atggaataag
                                                                       300
                                                                       301
      <210> 306
      <211> 8
      <212> PRT
      <213> Homo sapien
      <400> 306
Val Leu Gly Trp Val Ala Glu Leu
                 5
      <210> 307
      <211> 637
      <212> DNA
      c213> Homo sapien
      <400> 307
acagggratg aagggaaagg gagaggatga ggaagccccc ctggggattt ggtttggtcc
                                                                         60
                                                                        120
ttgtgatcag gtggtetatg gggcttatcc ctacaaagaa gaatccagaa ataggggcac
attgaggaat gatacttgag cccasagage attcastcat tgttttattt gccttmtttt
                                                                        180
                                                                        24 D
cacaccattg gtgagggagg gattaccacc ctggggttat gaagatggtt gaacacccca
cacatageae eggagatatg agatemacag tetettagee atagagatee acageccaga
                                                                        300
                                                                        360
geaggaggae gettgeacae catgeaggat gaeatggggg atgegetegg gattggtgtg
aagaagcaag gactgttaga ggcaggcttt atagtaacaa gacggtgggg caaactctga
                                                                        420
tttccgtggg ggaatgtcat ggtcttgctt tactaagttt tgagactggc aggtagtgaa
                                                                        480
actuattage otgagazeet tetegasatee actteaccea ecteatagas gaagtagcea
                                                                        540
ggtgggagen teterragtg ggtgtgggae atatetggea agattttgtg geacteetgg
                                                                        600
                                                                        637
ttacagatac tggggcagca aataaaactg aatcttg
       <210> 308
       <211> 647
       <212> DNA
       c213> Homo sapien
       c220>
       <221> misc feature
       <222> (1)...(647)
       <223> n = A,T,C or G
```

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<400> 3DB
   acqattttca ttatcatqta aatcgggtca ctcaaggggc caaccacagc tgggagccac
   tgetcegggg aapytteata tgggaettte tactgeecaa ggttetatae aggatataaa
                                                                           60
   ggngcctcac agtatagato tggtagoaaa gaagaagaaa caaacactga tototttotg
                                                                          120
   ccacccetet gaccetttgg sacteetetg accetttaga acasgeetae etsatstetg
                                                                          100
  ctagagaaaa gaccaacaac ggcctcaaag gatctcttac catgaaggtc tcagctaatt
                                                                          240
  cttggctaag atgtgggttc cacattaggt totgaatatg gggggaaggg tcaatttgct
                                                                          300
  cattligigt giggataaag toaggatgoo cagggggooag agcagggggc tgottgottt
                                                                          360
  gggsacestg gctgagcata taaccatagg ttatggggaa caaaacaaca tcaaagtcac
                                                                          420
  tgtatceatt gccatgaage cttgagggac ctgaatctac cgattcetot taaggcagca
                                                                          480
  ggaccagttt gagtggcaac aatgcagcag cagaatcaat ggaaacaaca gaatgattgc
                                                                          540
  aatgteettt ttitteteet gettetgaet tgataaaagg ggaeegt
                                                                         6 D 🛭
                                                                         647
        <210> 309
        <211> 460
        <212> DNA
        <213> Homo sapien
        <400> 309
  actitatagi tinggotgga catiggaasa assaassaago cagascaaca igigatagai
  aatatgatig getgeacaet tecagaetga tgaatgatga acgtgatgga etaltgtatg
                                                                          60
  gagracatet teageaagag ggggaaatae teateatett tegecageag tigitigate
                                                                         120
 accadacate atgecagaat acteageada cettettage tettgagaag tedaagteeg
                                                                         180
 ggggaattta ttootggcaa ttttaattgg actoottatg tgagagcagc ggctacccag
                                                                         240
 ctggggtggt ggagcgaace cgtcactagt ggacatgcag tggcagaget cctggtaace
                                                                         300
 acctagagga atacacagge acatgtgtga tgccaagcgt gacacctgta gcactcaaat
                                                                         360
 ttgtcttgtt tttgtcttte ggtgtgtaag attcttaagt
                                                                         420
                                                                         460
       <210> 31D
       <211> 539
       <212> DNA
       <213> Homo sapien
       <400> 310
 ergggaetta teaaataaag ataggaaaag aagaaaacte aaatattata ggeagaaatg
 ctaaaggttt taaaatatgt caggattgga agaaggcatg gataaagaac aaagttcagt
                                                                         бÒ
 taggaaagag aaacacagaa ggaagagaca caataaaagt cattatgtat tetgtgagaa
                                                                        120
 gtcagacagt asgattegtg ggasatgggt tggtttgttg tatggtatgt attttagcaa
                                                                        180
 taatetttat ggeagagaaa getaaaatee tttagettge gtgaatgate acttgetgaa
                                                                        240
 ttrctcaagg taggratgat gaaggagggt ttagaggaga caragacara atgaartgar
                                                                        300
ctagatagaa agoottagta tactoagota ggaatagtga ttotgagggo acactgtgac
                                                                        360
atgattatgt cattacatgt atggtagtga tggggatgat aggaaggaag aacttatggc
                                                                        420
atattttrac ccccacaasa gtragttass tattgggers ctsaccator aggtcasga
                                                                        480
                                                                        539
      <210> 311
      <211> 526
      <212> DNA
      <213> Homo sapien
      <220>
      <221> misc_feature
      <222> (1)...[526]
      <223> n = A,T,C or G
      <400× 311
ceaattigag ccaatgacat agaattitac eaatceagea gottaticig gggocettic
ttttgaogtt ttetetaaac tactaaagag gcattaatga tocataaatt atattateta
                                                                        €Û
catttacago atttasaatg tgttosgcat gasafattag ctacagggga agotaaataa
                                                                       120
                                                                       180
```

```
attadacatg gaataaagat tigtoottaa atataatota caagaagact tigataitig
                                                                       240
tettteacaa gtgaageatt ettataaagt gteataaeet ttttggggaa actatgggaa
                                                                       300
aasatggggs asctotgaag ggttttasgt atcttacotg aagctacaga otccataaco
                                                                       360
tetetttaca gggageteet geageceeta cagasatgag tggetgagat tettgattge
                                                                       420
acagcaagag cttctcatct aaaccctttc cctttttagt atctgtgtat caagtataaa
                                                                       680
                                                                       526
agtictataa actgiagini acttattita atccccaaag cacagi
      <210> 312
      <211> 500
      <212> DWA
      <213> Homo sapien
      <22B>
      <221> misc feature
      <222> (1) ... (500)
      <223> n = A,T,C or Q
      <400> 312
cetetetete eccaececet gactetagag aactgggttt teteceagta etccageaat
                                                                        60
teatitetea aageagtiga gecaettiat tecaaagtae actgeagatg ticaaactet
                                                                       120
coatttetet ttecetteea ectgecagtt ttgctgacte teaacttgte atgagtgtaa
                                                                       180
quattaagga cattatgett ettogatiot gaagacagge cetgeteatg gatgactetg
                                                                       240
gettettagg aaaatatttt tetteeaaaa teagtaggaa atetaaaett ateceetett
                                                                       300
Egragatgic tagoagetto agacattigg thakgaacoo atgggaaaaa aaaakatoot
                                                                       360
tgctaatgtg gtttcctttg taaaccanga ttcttatttg netggtatag aatatcaget
                                                                        420
ctgaacgtgt ggtaaagatt tttgtgtttg aatataggag aaatcagttt gctgaaaagt
                                                                        48D
                                                                        500
tagtettaat tatetattgg
      <210> 313
       <211> 718
       <212> DNA
       <213 Homo sapien
       <220>
       <221> misc feature
       <222> (1) ... (71B)
       <223> n = A,T,C or G
       <400> 313
 ggagatttgt gtggtttgca gccgagggag accaggaaga tctgcatggt gggaaggacc
                                                                         60
 tgatgataca gaggtgagaa ataagaaagg ctgctgactt taccatctga ggccacacat
                                                                        120
 ctgctgaaat ggagataatt aacatcacta gaaacagcaa gatgacaata taatgtctaa
                                                                        ១ឧក
 gtagtgacat gtttttgcac atttccagcc cttttaasta tccacacaca caggaagcac
                                                                        240
 aaaaggaagc acagagatee etgggagaaa tgeeeggeeg eestettggg teategatga
                                                                        300
 geotogooct gtgcctgntc cogettgtga gggaaggaca ttagaaaatg aattgatgtg
                                                                        360
 ttoottaaag gatggcagga aaacagatoo tgttgtggat atttatttga acgggattac
                                                                        420
 agatttgasa tgaagtcaca aagtgagcat taccaatgag aggasaacag acgagasaat
                                                                        480
 cttgatggtt cacaagacat gcsacaaaca saatggaata ctgtgatgac acgagcagco
                                                                        540
 aactggggag gagataccac ggggcagagg tcaggattet ggccctgctg cctaactgtg
                                                                        600
 ogttatacca atcatttcta tttctaccct caaacaagct gtngaatatc tgacttacgg
                                                                        660
 ttettntgge coacatitte atnatecace cententitt aannttante caaantgt
                                                                        718
       <210> 314
       <211> 358
       <212> DNA
       <213> Homo sapien
       c400> 314
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```
gtttatttac attacegass asacatcasg scastgtata ctatttcasa tatetccats
   cataatcaaa tatagrigta gtacatgttt tcattggtgt agattaccac aaatgcaagg
                                                                           60
   coacatgtgt agatetettg tettattett ttgtetataa taetgtattg tgtagtecaa
                                                                          150
  geteteggta giccagecae tgtgaaacat getecettta gattaacete giggaegete
                                                                          180
  ttgttgtatt getgaactgt agtgeeetgt attttgette tgtetgtgaa ttetgttget
                                                                          240
  totggggcat ttoottgtga tgeagaggac caccacacag atgacagcaa totgaatt
                                                                          300
                                                                          35R
         <210> 315
         <211> 341
         <212> DMA
        <213> Homo sapien
        <400> 315
  taccadetee degetogeae teatgagees cateaceate straceages ecatoasses
  ataggtgatg atgaggacat ggaatgggcc cccaaggatg gtctgtccaa agaagcgagt
                                                                           6 D
  gacecccatt etgaagatgt etggaacete taceageagg atgatgatag ecceaatgae
                                                                          120
  agteaceage teceegacea geoggatate gteettaggg gteatgtagg etteetgaag
                                                                         JB0
  tagettetge tgtaagaggg tgttgteeeg ggggetegtg eggttattgg teetgggett
                                                                         240
  gagggggogg tagatgcagc acatggtgaa gcagatgatg t
                                                                         300
                                                                         341
        <210> 316
        <211> 151
        <212> DNA
        <213> Homo sapien
       <400> 316
 agactgggca agactettae geoccacaet geaatttggt ettgttgeog tatecattta
 tgtgggcett tetegagttt etgattataa acaceaetgg agegatgtgt tgaetggaet
                                                                         120
 calteaggga grictggilg caatattagt t
                                                                         151
       <210> 317
       c211> 151
       <212> DNA
       <213> Homo sapien
       <400> 317
 agsactagtg gatcctaatg aaatacctga aacatatatt ggcatttatc aatggctcaa
 atetteattt atetetggee ttaaceetgg eteetgagge tgoggeeage agateeeagg
                                                                         60
 ccagggetet gttettgeca cacetgettg a
                                                                        120
                                                                        151
       <210> 318
       <211> 151
       <212> DNA
       <213> Homo gapien
      <400> 318
actggtggga ggcgctgttt agttggctgt tttcagaggg gtctttcgga gggacctcct
gotgeagget ggagtgtett tatteetgge gggagaeege acatteeact getgaggetg
                                                                        6 D
                                                                       120
tgggggggt ttatcaggca gtgataaaca t
                                                                       151
      <210> 319
      <211> 151
      <212> DNA
      <213> Homo sapien
      <400> 319
aactagtgga teeagageta taggtacagt gtgateteag etttgeaaac acatttteta
catagatagt actaggtatt aatagatatg taaagaaaga aatcacacca ttaataatgg
                                                                        60
```

	151
taagattggg titatgigat titagigggi a	
<210> 320	
<211> 150	
<212> DNA	
<213> Homo sapi¢¤	
<400> 320	•
	6D 12D
magoggotigo cottititti tittitittej giggigaaco coccoccio kadajoosso	150
gagtgtteta cagettacag taaataccat	
<210> 321	
<211> 151	
<212> DNA	
<213> Homo gapien	
<400> 321	60
agreentite titterator aggitatite aggettagga titorictea carbgragit	120
tagggtggca ttgtaaccag ctatggcata ggtgttaacc aaaggttgag taaccatggs	151
tgcctctgag aaatcaaagt cttcatacac t	
<210> 322	
<211> 151	
<212> DNA	
<213> Homo sapien	
<220>	
<221> misc_feature	
<222> (1)(151)	
<223> n = A,T,C or G	
<400> 322	60
atcoagcate tectectet tettecette ettettette tettasatt etectteage	120
titigggettg greatitige cacagggett ggagatggtg acagtettet ggeattegge	151
attgtgcagg gctcgcttca nacttccagt t	
<210> 323	
<211> 151	
<212> DNA	
'<213> Homo zapied	
<220>	
<221> misc_feature	
<222> (1),, (151)	
<223> n = A,T,C or G	
<400> 323	60
tgaggacttg tkttctttt ctttattttt aatcctctta ckttgtaaat atattgccta	120
nagacteant tactacceas titigiggitti twigggagaa atgtaactgg acagttaget	151
gttcsatyes sessecatt encocatgts s	
<310> 324	
<211> 461	
<212> DNA	
c213> Homo sapien	
c220>	

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<221> misc feature
         <222> {1}...(461)
         \langle 223 \rangle n = A,T,C or G
        <40D> 324
  acctgtgtgg aatttcaget ttcctcatgc aaaaggattt tgtatccccg gectacttga
  agaagtggtc agctaaagga atccaggttg ttggttggac tgttaatacc tttgatgaa
                                                                           ٤D
  agagttacta ogaatcecat cttggtteca gctatateac tgacagcatg gtagaagact
                                                                          120
  gegaacetea ettetagaet tteaeggtgg gaegaaaegg gtteagaaac tgeeagggge
                                                                          18D
  ctcatacagg gatatcaaaa tacceEttgt gctacccagg ccctggggaa tcaggtgact
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Leu Tyr Met Ala Ala Pro Gln Ile Arg Lys Met Leu Ser Ser Gly Val
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25
Cys Thr Ser Thr Val Glm Leu Pro Gly Lys Val Val Val Thr Gly
Ala Asn Thr Gly Ile Gly Lys Glu Thr Ala Lys Glu Leu Ala Gln Arg
Gly Ala Arg Val Tyr Leu Ala Cys Arg Asp Val Glu Lys Gly Glu Leu
                                        75
Val Ala Lys Glu Ile Gln Thr Thr Thr Gly Asn Gln Gln Val Leu Val
                                    90
Arg Lys Leu Asp Leu Ser Asp Thr Lys Ser Ile Arg Ala Phe Ala Lys
                                105
Gly Phe Lev Ala Glu Glu Lys His Lev His Val Lev Ile Agn Asn Ala
                                                125
                            120
Gly Val Met Met Cym Pro Tyr Ser Lym Thr Ala Amp Gly Phe Glu Met
                        135
His Ile Gly Val Asn His Leu Gly His Phe Leu Leu Thr His Leu Leu
                                        155
                    150
Leu Glu Lys Leu Lys Glu Ser Ala Pro Ser Arg Ile Val Asn Val Ser
                                                         175
                                    170
                165
Ser Leu Ala His His Leu Gly Arg Ile His Phe His Ash Leu Gln Gly
                                185
Glu Lys Phe Tyr Asn Ala Gly Leu Ala Tyr Cys His Ser Lys Leu Ala
                                                 205
                             200
Asn Ile Leu Phe Thr Gln Glu Leu Ala Arg Arg Leu Lya Gly Ser Gly
                        215
Val Thr Thr Tyr Ser Val His Pro Gly Thr Val Gln Ser Glu Leu Val
                    230 .
                                         235
Arg His Ser Ser Phe Met Arg Trp Met Trp Trp Leu Phe Ser Phe Phe
                                     250
                245
Ile Lys Thr Pro Glo Glo Gly Ala Glo Thr Ser Leu His Cys Ala Leu
                                 265
            260 .
Thr Glu Gly Leu Glu Ile Leu Ser Gly Asn His Phe Ser Asp Cys His
                             260
Vel Ala Trp Val Ser Ala Gln Ala Arg Asn Glu Thr Ile Ala Arg Arg
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Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp
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       <210> 340
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<210> 340 <211> 483 <212> DNA <213> Homo sapien

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<210> 341 <211> 344 <212> DNA <213> Homo sapien

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                                                                          60
  gotgoottac aagtattaaa tattttactt otttooataa agagtagoto aaaatatgoa
                                                                         120
  attaatttaa taatttetga tgatggtttt atetgeagta atatgtatat catetattag
                                                                         180
  aetttactta atgaazaact gaagagaaca aaatttgtaa ccactagcac ttaagtactc
                                                                         240
  ctgattetta acattgtett taatgaceae sagsesses seag
                                                                         300
                                                                         344 .
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  caatgtggea ecttetteta ettggtteca ttatgaagtt ggecaattge tgetateeca
                                                                         60
  cotggoaggt asaccaatgo casgagagtg atggasacca toggoaagso totgttgatg
                                                                        12D
  accaggattg geattttate assatsttgt tgatgggsag ttgctasagg gtgsattact
                                                                        18D
  tecerteagaa gagtetaaag aaaagteaga gateetataa tageagetat tttaattege
                                                                        240
 aagtgecaet gtggaaagag tteetgtgtg tgetgaagtt etgaagggea gteaaattea
                                                                        300
  teageatggg ctgtttggtg casatgcaas agcacaggte tttttagcat getggtetet
                                                                        360
 coogtiguet tatgeasata atogeettet tetaaatite teetaggett cattiteeaa
                                                                        420
 agtictiont ggtitgigat geotittetg officeatta attotalasa atagtatggo
                                                                        480
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                                                                        540
                                                                        592
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       <211> 382
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       <400> 343
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 cetgeaacte treitectes teteteres territores egectetere arcetgetgt
                                                                        120
 agacttettg attgteagte tgtgteacat ceagtgattg ttttggttte tgtteeettt
                                                                       180
 ctgactgccc aaggggctca gaaccccagc aatcccttcc tttcactacc ttcttttttg
                                                                       240
 paggtagttg paapggacta aaattataag gagaaggtag gagacatc aataaagagg
                                                                       300
                                                                       360
 аввссессва дседававав ва
                                                                       382
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       <211> 536
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caataggcca catagactg gctggatgga acctcacaat aaggtggtca cctcttgttt
                                                                        €0
gtttaggggg atgccaagga taaggccagc tcagttatat gaagagaagc agaacaaaca
                                                                       120
agtotttoag agaaatggat gcaatcagag tgggatcocg gtcacatcaa ggtcacacto
                                                                       180
cacetteatg tectgaate etteccaget cagaaaaate cacecettac gagtgogget
                                                                       24D
togaccetat ateccegee egegteeett tetecataaa attettetta gtagetatta
                                                                      30D
cottottatt attigatota gaaatigeed toottitaed cotaccatga geodtacaaa
                                                                      36 D
caactaacet gecactaata gitatgicat contettati aateateate ciagoontaa
                                                                      420
gtctggccta tgagtgacta caaaaaaggat tagactgage cgaataacaa aaaaaa
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                                                                      536
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<211> 251

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                                                                       120
gegteggees egasateses tectaesete eccaggages agacacattt ategasessa
                                                                       180
asataacata toggattigg agagacactg coaactggot ggagattaat coggacactg
                                                                       240
                                                                       251
gtgccatttc c
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      <211> 282
      <212> DNA
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      c220>
      <221> misc feature
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                                                                        120
agggagarta tacctggctc ttgccctaag tgagaggtct tccctcccgc accaaaaat
                                                                        180
agaaaggett tetattteac tggeecaggt aggggsaagg agagtaaett tgagtetgtg
                                                                        240
                                                                        282
ggtetrattt cccaaggtgc ettcaatget catnaaaace aa
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       <211> 201
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                                                                         60
 taaatataac tittaaaana niactancag citttaccia ngciectaaa igciigiaaa
                                                                        120
 tetgagaetg aetggaeeea eecagaeeea gggeaaagat acatgttaee atateatett
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                                                                        201
 tateaageat tittittigt c
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                                                                         бD
 agagagaaca gtgccagaat gazactgacc ctaagtccca ggtgcccctg ggcaggcaga
                                                                        120
 aggagacaet cocageates aggagggttt atetteteat cetaggteag geetacaatg
                                                                        180
 ggegaaggtt ttattataga actoccasea geocacctca ctoctgccac ccacecgatg
                                                                        240
                                                                        251
 geeetgeete e
       <210> 349
       <211> 251
       <212> DNA
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## <213> Homo sapien

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taanaatcaa geeatttaat tytatettty aagytaaaca atatatyyya yetyyateae	60
Baccectgag gatgccagag ctatgggtcc agascatggt gtggtattat cascagagtt	120
cagaagggte tgaactetae gtgttaecag agaacataat geaatteatg cattecaett ageaattttg taaaataeca gaaacagaee eeaagagtet tteaagatga ggaaaattea	180
actectgett t	240
	251
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agecegoceg gigaageteg etgettteee taceteetta agigaetgee aaaegeceae	120
cggctggaat tgctctggtt atgatgacag agaaaatgat ctcttcctct gtgacaccaa	180
cacctgtama titgatgggg matgtttaag aattggagac actgtgactt gcgtctgtca	24D
giteaagige aacaaigaet aigigeetgi gigiggetee aaiggggaga getaceagaa	300
tgagtgttac etgegacagg etgeatgeaa acageagagt gagataettg tggtgteaga	360
aggatcatgt gccacagtoc atgaaggetc tggagaaact agtcaaaagg agacatccac	42D
ctgtgatatt tgccagtttg gtgcagaatg tgacgaagat gccgaggatg tctggtgtgt	48D
gtgtaatatt gactgttete aaaccaactt caateceete tgegettetg atgggaaate	54Ô
ttatgataat geatgecass tessagaage stegtgteag saacsggaga saattgaagt	600
catgiciting ggicgatgic magatamean ametamant actampicing magatgggca	660
ttatgcaaga acagattatg cagagaatgc taacaaatta gaagaaagtg ccagagaaca	720
coacatacet tyteoggaac attacaatgg cttetgeatg catgggaagt gtgageatte	780
tatematatg caggageest cttgcaggtg tgatgetggt tatactggac sacactgtgs	840
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aatcgcag	908
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cattaacttg attttaaaat cagwittgyg agtcatttac cacaagctaa atgtgtacac	16D
tatgatassa acaaccattg tattectgtt tttctsasca gtcctsattt ctsacactgt	24 D
atatateett Ogacateaat gaactitgit itetittaet eesotaataa sotageesea	300
gatetéteda Caacaaactt écenteteat geottgeott traccatgot otgotecago	360
ceageeeet titggeeigt iigittigic aaaaacetam teigetteit geittielig	420
gtaatatata titagggaag atgitgettt geecacacae gaagcaaagt aa	472
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caggergegt recgtertta egargaagae eaegargeag titeeaaaca tigeeactae	180
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aataagcaca a	251

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                                                                       120
                                                                       180
gtatocaaaa gossaacago agatatacaa aattaaagag acagaagata gacattaaca
                                                                       24D
gataaggcaa cttatacatt gacaatccaa atccaataca tttaaacatt tgggaaatga
qqqqqacmaa tqqmaqccar atcamattig tgtamamctm ttcagtatgt ttcccttgct
                                                                      : 300
toatgtotga raaggototo oottoaatgg ggatgacaaa otocaaatgo cacacaaatg
                                                                       360
ttaacagaat actagattca cactggaacg ggggtaaaga agaaattatt ttotataaaa
                                                                       420
                                                                       436
gggeteetaa tgtagt
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      <211> 854
      <212> DNA
      <213> Homo aapien
      c400> 354
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caagtotgaa accaaatota ggaaacatag gaaacgagoo aggoacaggg otggtgggoo
                                                                       120
                                                                       180
atcagggace acceptings tigatatith settaatets calcitities stassatest
                                                                       240
ctggcagtag aagctgttct ccaggtacat ttctctagct catgtacaaa aacatcctga
aggactttgt caggtgoott gotaaaagoo agatgogtto ggcacttoot tggtotgagg
                                                                       300
ttaattgeac acctacagge actgggetea tgettteaag tattttgtee teactttagg
                                                                       360
ptgagtgaan gatoccoett ataggagcer ttgggagaga tratatasas grtgertett :
                                                                       420
gagtacatgc agtaatgggg tagatgtgtg tggtgtgtct tcattcctgc aagggtgctt
                                                                       48D
gttagggagt gtttccagga ggaacaagtc tgaaaccaat catgaaataa atggtaggtg
                                                                       54D
tgaactggaa aactaattca amagagagat cgtgatatca gtgtggttga tacaccttgg
                                                                       600
caatatagas ggctotaatt tgoccatatt tgaaatsats attoagottt tigtaatsoa
                                                                       660
                                                                     · 720 :
asataacaaa ggattgagaa tcatggtgtc taatgtataa aagacccagg aaacataaat
atateaactg cataaatgta aaatgeatgt gacceaagaa ggccceaaag tggcagacaa
                                                                       780
                                                                       840
cattgtacce attitecett ccaaaatgtg ageggrggge etgetgettt caaggetgte
                                                                       954
ecacgggatg trag
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caggicaaag cigatotito iggaatgica coaaccaagg gootatatti atcaaaagco
                                                                       120
                                                                       180
atocacaagt catacotgga tgtcagogaa gagggcaogg aggcagcago agccactggg
gacageateg etgtasaaag eetaeeaatg agageteagt teaaggogaa eeaceeette
                                                                       240
etgitetta taaggeacae toataecaae acgatectat tetgiggeaa gefigeetet
                                                                       300
cccteatcag atggggttga gteaggctca gagttgcaga tgaggtgcag agacaatcct
                                                                       360
                                                                       42 D
gtgactttcc cacggccasa sagetgttca caccteacge acetetgtgc ctcagtttgc
                                                                       480
tcatctgcaa aataggtcta ggatttcttc caaccatttc atgagttgtg aagctaaggc
                                                                       540
tttgttaatc atggaaxaag gtagacttat gcagaaagcc tttctggctt tcttatctgt
ggtgtctcat ttgagtgctg tccagtgaca tgatcaagtc aatgagtaaa attttaaggg
                                                                       50Q
                                                                       66Q
attagattit ettgaettgt atgtatetgt gagatettga ataagtgaee tgaeatetet
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gottaaagaa aaccag
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<210> 356

<211> 574

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                                                                         120
 casgettece attestagat eteagtgeet atgagtatet gacacetgtt cetetetea
                                                                         180
 gtetettagg gaggettaaa tetgteteag gtgtgetaag agtgeeagee caaggkggte
                                                                         240
 easagtecae assactgesg tetttgetgg gatagtsage casgesgtge etggacages
                                                                        300
 gagtietttt ettgggcaar agataarrag araggartet aatrgtgete ttatteaara
                                                                        360
 ttettetgte tetgeetaga etggaataaa aageeaatet etetegtgge acagagaaagg
                                                                        420
 agatacaago togittacat gigatagato taacaaaggo atotacogaa giotggiotg
                                                                        48D
 gatagaegge acagggaget ettaggteag egetgetggt tggaggaeat teetgagtee
                                                                        54D
 agetttgcag cetttgtgca acagtaettt ceca
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       <211> 393
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                                                                         60
 aggecacase caaractiga tittateaac asaaaceeet aaatataaac ggsaaaaaag
                                                                        120
 atagatataa ttattoragt tttttaaaa ottaaaarat attooattgo ogaattaara
                                                                        180
                                                                        240
 araarataag tgttatatgg aaagaagggc ettcaagcac actaaaraaa cctgaggkaa
gcataatetg tacaaaatta aactgteett tttggcattt taacaaattt gcaacgktet
                                                                        300
                                                                       36D
 Ethettett titotgibtt bittettbbt bac
                                                                       EEE
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      <211> 630
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                                                                       120
gcatagagta gggaagctaa teragracag ggaggtcaca gagaratere taaggaagtg
                                                                       180
gagtttaaac tgagagaagc aagtgettaa actgaaggat gegtegaaga agaagggaga
                                                                       240
gragaacaat trgggcagag ggaacettat agacectaag graggaaggt teaaogaact
                                                                       300
gaaagagage tagaacaget ggageegtte teeggtgtaa agaggagtea aagagataag
attaaagatg tgaagattaa gatettggtg geatteaggg attggeaett etacaagaaa
                                                                       360
                                                                       42D
tractgaagg gagtaatgtg acattacttt tracttragg atggeratte taacteragg
                                                                       480
gggtagactg gactaggtaa gactggaggc aggtagacct cttctaaggc ctgcgatagt
                                                                       540
gaaagacaaa aataagtggg gaaattcagg ggatagtgaa aatcagtagg acttaatgag
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caagecagag gtteetecae aacaaccagt
                                                                       630
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     <400> 359
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aggattaact gittitaggaa cagatataaa gettegeese ggaagsgatg gacaaascae
                                                                       300
                                                                       360
assgecaaca tgatacetta ggsageasca ctaccettec aggestassa tetggsgasa
tgcaacatta tgcttcatga ataatatgta gaaagaaggt ctgatgaaaa tgacatcctt
                                                                       920
aatgtaagat aactttataa gaattetggg teasataaaa ttetttgaag aaaaeateea
                                                                       480
aatgteattg acttateaaa tactatettg geatataace tatgaaggea aaactaaaca
                                                                       540
ancannage teresecann ennacente nacttatttt gtattetata achtaegaga
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                                                                       62D
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                                                                       120
tactcatcat titiggocag cagitgitig atcaccaaac atcatgccag aatactcagc
                                                                       180
                                                                       240
aaacettett agetettgag aagteaaagt eegggggaat ttabteetgg caattttaat
                                                                       300
tggactoott atgtgagago agoggotaco cagotggggt ggtggagega accogtoact
agtggaratg cagtggcaga getectggta accaectaga ggaatacaca ggcaratgtg
                                                                       360
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                                                                       431
agattettag t
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ttgggteete tggtetettg ccaagtttee eagecaeteg agggagaaat atogggaggt
                                                                       180
ttgacttect coggegettt cocgaggget teaccgtgag coctgeggec cteagggetg
                                                                       . 240
caabcotoga tteaatgtet gaaacetege tetetgeetg elggaettet gaggeegtea
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ctgccactct gtcctccago totgacaget cotcatotgt ggtcctgttg t
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                                                                         6 D
                                                                        12D
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                                                                        180
ceeeggicae agaaatgace aggitgggtg titteaaggtg ceagtgeigg gieageagei
cgtaaaggat ttocgegtee gtgtegeagg acagaegtat atactteeet ttetteecca
                                                                        240
                                                                        300
gtgtctcasa ctgaatatcc ccasaggcgt cggtaggaas ttccttggtg tgtttcttgt
                                                                        360
agticcatti ctcactitgg tigatctggg tgccttccat gtgctggctc tgggcatagc
                                                                        420
cacacttgca cacattotoc otgataagca ogatggtgtg gacaggaagg aaggatttca
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<213> Homo sapien

<221> misc\_feature

<220>

420

480

540

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<213> Homo sapien

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DOZOZZZ COC	222 62 7 6 7 6 6 6	gcgggtgcct	Bragrecesa	ctactcagga	rgetgaggea	1740
ひならなるなけるかか	wedawccoda	gaggtggagg	ccacaacasa	ccgagatecg	ccactacact	1800
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350 340 345 lle Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile 360 365 . 355 Ser Ser Glu Asn Ser Asn Pro Glo Asn Val Ser Arg Thr Arg Asn Lys 380 375 Pro Arg Thr His Met Val Val Glu Val Asp Ser Met Pro Ala Ala Ser 395 390 Ser Val Lys Lys Pro Phe Gly Leu Arg Ser Lys Met Gly Lyc Trp Cys 410 405 Cys Arg Cys Phe Pro Cys Cys Arg Glu Ser Gly Lys Ser Asn Val Gly 425 420 Thr Ser Gly Asp His Asp Asp Ser Ala Met Lys Thr Leu Arg Ser Lys 440 435 Met Gly Lys Trp Cys Arg His Cys Phe Pro Cys Cys Arg Gly Ser Gly 450 455 Lyc Ser Aon Val Gly Ala Ser Gly Aop His Aop Aop Ser Ala Met Lyo 475 470 Thr Leu Arg Asn Lys Met Gly Lys Trp Cys Cys His Cys Phe Pro Cys 490 485 Cys arg Gly Ser Gly Lys Ser Lys Val Gly Ala Trp Gly Asp Tyr Asp 505 Amp Ser Ala Phe Met Glu Pro Arg Tyr His Val Arg Gly Glu Amp Leu 520 Asp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg Lys Asp 535 Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Lys Asp Lys Gln 555 550 Lys Arg Thr Als Leu Ris Leu Als Ser Als Asn Gly Asn Ser Glu Val 565 570 Val Lys Leu Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asn 585 Lys Lys Arg Thr Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu 600 Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp 620 615 Glu Tyr Gly Asn Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys 635 **630** Leu Met Ala Lys Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys 65D 645 Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Val His Glu Gln Lys 665 Gin Gin Val Val Lys Phe Lev Ile Lys Lys Lys Ala Asn Leu Asn Ala 685 68D Lou Amp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cym Cys Gly 700 695 Ser Ala Ser Ile Val Ser Leu Leu Leu Glu Gln Asn Ile Asp Val Ser 710 715 Ser Gln Asp Leu Ser Gly Gln Thr Ala Arg Glu Tyr Ala Val Ser Ser 730 725 His His Kis Val Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln 745 Met Leu Lys Ile Ser Ser Clu Asn Ser Asn Pro Glu Gln Asp Leu Lys 765 760 Leu Thr Ser Glu Glu Glu Ser Gln Arg Phe Lys Gly Ser Glu Ash Ser 780 775 Gin Pro Glu Lys Met Ser Gin Glu Pro Glu Ile Asn Lys Asp Gly Asp 795 790 Arg Glu Val Glu Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly

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1265			i an	Glu '	127D	el v	Aen	Thr	Thr	Leu	His	Tyr :	Ala	Ile	Tyr
Asn	Glu	Asp	Lys	Leu	Met .	Ala	Lys	Ala	Leu	Leu	Leu	Tyr	Gly 1310	Ala .	Asp
_		_	1300	) Asn	T	174 A	G) v	1305	ጥኮሎ	Pro	Leu				Val
							1 321								
Kis		Gln	ГÀВ	GJD	Gln	val 1335	val	Lys	Phe	ŗen	Ile 1340	Lys	ГЛа	Lya	Ala
	1330	3		Leu	2	7222	ው የ	ดาษ	Ara	Thr	Ala	Leu	Ile	Leu	Ala
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11e	Asp	Val	Вет	Ser	Gln	Авр	Lou	Sar	Gly	Gln	Thr	Ala	1390	บาน	TYL
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7	65.0	139	5 /31 ∧	Met	Leu	Lvs	Ile	Ser	Ser	Glu	Açn	Ser	Agn	Pro	Glu
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Ġln	ABD	Leu	Lya	Leп	Thr	ser	Glu	Glu	Glu	Ser	Gln	Arg	Phe	ГÀв	Gly 1440
				Gln 1449	=				1717						_
Lув	Asp	Gly	Авр	Arg	Glu	Val	Glu	Glu	_Glu -	Met	Lys	ГÀВ	1470	л СТП	sei
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neA	Asn			ГБЛ	Leu	GIA	198	υ π≅π	1111	<b>M</b> 011	.52.3	14B	5		-
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Аап	Gln	Ğlπ	Phe	Pro	дер	Asn	Glu	Ser	Glu	Glu	Tyr	His	Arg	Ile	Cys
					7.57	rs.				127	_				
				Asp 152											
Glu	. Asr	Ser	Ann	Pro	ejn	Gìn	IBA .	Leu	The	Гел	Thr	Ser	155	6313 ^	GIU
			3 P 4	_				179	_					_	
Sez	Gli	) Art	Lev	. Glu	ЭΙγ	SCI	156	L ASA Co	GAY	Q2 11	•••	156	_, 5		
m3 w		155	15 	ıIle	ARR	IVE	ABT	.Gly	Авр	Arg	Glu	Leu	Glu	Aan	Phe
Met	. Ala	. Ile	: Glu	. Glu	Met	Lys	Lys	Hi9	Gly	Ser	. Thr	His	Val	Gly	Phe 1600
L¢	a I1:	e Pr	Pro	) Azg	Lys	8e2	Arg	The	Pro	) GIU	5et	. GII	163	. No.	Pro
ABJ	Th	r Gl	a Aei	n Gli	r Gra	туг	16	au 3 pet	. naj	, GIU		164	.5		Gln
•	_ 413.	16:	35 - ^~	. ar.		വാം	l As	r Thi	: Oly	, Ile	Leu			Glu	Ile
	_					421					106				
Lei	u Il	e Hi	s G1	u Gli	, Ly:	g).	11	e 01.	, Val	[ V⊅]	. Gii	Lyg	: Met	Agr	\$ <b>5€</b> ± 1680
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				761	7 E				103	งก					
Se	r Th	r Le	u Ar	g Gli	ı Glu	ינו	e Al	a Met	Let	ı Arg	y Lei	ı Glı	. Lei 17:	ı Aaş IO	Thr
			17	00				170	ノン				<b>4</b> 7.		
Мe	t Ly			n Se	- AT	ı rê.	μ								
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165 170 Leu His Leu Ala Ser Ala Asn Gly Asn Ser Glu Val Val Lys Leu Leu 185 Leu Asp Arg Arg Cys Gln Leu Asn Val Leu Asp Asu Lys Lys Arg Thr 200 205 Ala Leu Ile Lys Ala Val Gln Cys Gln Glu Asp Glu Cys Ala Leu Met 215 Leu Leu Glu His Gly Thr Asp Pro Asn Ile Pro Asp Glu Tyr Gly Asn 230 235 Thr Thr Leu His Tyr Ala Ile Tyr Asn Glu Asp Lys Leu Met Ala Lys 245 25D Ala Leu Leu Leu Tyr Gly Ala Asp Ile Glu Ser Lys Asn Lys His Gly 265 Leu Thr Pro Leu Leu Cly Val His Glu Gln Lys Gln Gln Val Val 28D Lys Phe Leu Ile Lys Lys Ala Asn Leu Asn Ala Leu Asp Arg Tyr 295 Gly Arg Thr Ale Leu Ile Leu Als Val Cys Cys Gly Ser Ala Ser Ile 310 315 Val Ser Leu Leu Geu Glo Abn Ile Asp Val Ser Ser Gln Asp Leu 325 330 Sez Gly Gln Thr Ale Arg Glu Tyr Ala Val Ser Ser His His His Val 345 Ile Cys Gln Leu Leu Ser Asp Tyr Lys Glu Lys Gln Met Leu Lys Ile 360 ser Ser Glu Aen Ser Aen Pro Glu Gln Aep Leu Lye Leu Thr Ser Glu 375 380 Glu Glu Ber Gln Arg Phe Lys Gly Ser Glu Asn Ser Gln Pro Glu Lys 390 Met Ser Gln Glu Pro Glu Ile Asn Lys Asp Gly Asp Arg Glu Val Glu 405 410 Glu Glu Met Lys Lys His Glu Ser Asn Asn Val Gly Leu Leu Glu Asn 420 425 Leu Thr Asn Gly Val Thr Ala Gly Asn Gly Asp Asn Gly Leu Ile Pro 440 Gln Arg Lys Ser Arg Thr Pro Glu Asn Gln Gln Phe Pro Acp Asn Glu 455 Ser Glu Glu Tyr His Arg Ile Cys Glu Leu Val Ser Asp Tyr Lys Glu 47D 475 Lys Cln Met Pro Lys Tyr Ser Ser Glu Asn Ser Asn Pro Glu Gln Asp 490 Leu Lys Leu Thr Ser Glu Glu Glu Ser Gln Arg Leu Glu Gly Ser Glu 500 505 Asn Gly Gin Pro Glu Lys Arg Ser Glo Glu Pro Glu Ile Asn Lys Asp 520 Gly Asp Arg Glu Leu Glu Asn Phe Met Ala Ile Glu Glu Met Lys Lys 540 His Cly Ser Thr His Val Gly Phe Pro Glu Asn Leu Thr Asn Gly Ala 555 The Ala Gly Asn Gly Asp Asp Gly Leu Ile Pro Pro Arg Lys Ser Arg 570 Thr Pro Glu Ser Gln Gln Phe Pro Asp Thr Glu Asn Glu Glu Tyr His 5**85** Ser Asp Glu Gln Asn Asp Thr Gln Lys Gln Phe Cys Glu Glu Gln Asn Thr Gly Ile Leu His Asp Glu Ile Leu Ile His Glu Glu Lys Gln Ile 615 Glu Val Val Glu Lys Met Asn Ser Glu Leu Ser Leu Ser Cys Lys Lys

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<212 > DNA
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cactgggagg ggacatectg cagaaggtag gagtgagcaa acaccogctg caggggaggg 180
gagageetty පුරුදෙදෙසු ඉඉදිකුපකුණේ ඉඉණුපකුණේ දේශ්රියෙක්මයි දේශ්රියෙක්මයි 540
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 caaggatgta tgataatatg tacaaagtaa ttocaactga ggaagetcae ctgateetta 2280
gtgtccaggg titttactgg gggtctgtag gacgagtatg gagtacttga ataattgacc 2340
 Egaagteete agacetgage tteeetagag tteaaacaga tacageatge tecagagtee 2400
Cagatgtaca aasacaggga ttcatcacaa atcccatctt tagcatgaag ggtotggoat 2460
ggcccaaggc cccaagtata tcaaggcact tgggcagaac atgccaagga atcaaatgtc 2520
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<211> 154
<212> PRT
<213> Homo sapiens
<4D0> 3B3
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Gly Lys Arg Gly Pro Leu Leu Gln Gly Leu Thr Trp Ala Thr Gly Gly

His Cys Phe Ser Ser Glu Glu Ser Gly Ala Val Asp Gly Ala Gly Gln 40

Lys Lys Asp Arg Ala Trp Leu Arg Cys Pro Glu Ala Val Ala Gly Phe

Pro Lew Gly Ser App Cyo Arg Glw Gly Cly Arg Cln Cly Cyo Cly Gly

ser Asp Asp Glu Asp Asp Leu Gly Val Ala Pro Gly Leu Ala Pro Ala

Trp Ala Leu Thr Gln Pro Pro Ser Gln Ser Pro Gly Pro Gln Ser Leu

Pro Ser Thr Pro Ser Ser Ile Trp Pro Glo Trp Val Ile Leu Ile Thr

Glu Leu Thr Ile Pro Ser Pro Ala His Gly Pro Pro Trp Leu Pro Asn

Ala Leu Glu Arg Gly His Leu Val Arg Glu

DESCRIPTION OF A STANDARD .

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<213> Romo gapiena
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ggggaagggt cecttttgca ttgccaagtg ccataaccat gagcactact ctaccatggt 180
tetgeeteet ggeeaageag getggtttge aagaatgaaa tgaatgatte tacagetagg 240
acttaecett gaaatggaaa gtettgeaat cecatttgea ggateegtet gtgcacatge 300
ctotgtagag agoagoatto coagggacet tggaaacagt tggcactgta aggtgcttgc 360
torccaagec acatrctees aggigtigts atggigsess cotticett etthatigec 420
cettettatt tatgigasca actgitigte tittitigta tettititaa actgiaasgi 480
teaattytya aaatyaatat catycaaata aattatycya tttttttte aaaytaaaaa 540
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<211> 337
<212> DNA
<213> Homo sapiens
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tetcaaagee atetgetgte ttegagtacg gacacateat cacteetgea ttgttgatca 180
amacgtggag gtgcttttcc tcagctaaga agcccttagc aaasgctcga atagacttag 240
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ctttggccac caattecece ttttecaeat eceggea
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<213> Homo sapiens
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gogacettgg ecegaagget chagcaagga eccacegace ecageegegg eggeggegge 180
geggaetttg ceeggtgtgt ggggeggage ggaetgegtg teegeggaeg ggcagegaag 240
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 <211> 537
 <212> DNA
 <213> Homo sapiene
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 tgaaccagga coggettetg ggcggctgaa agggcaagg aggcaaggac cocgtetete 180
 ccaoggatgg ggagaggca ggaggagacc cagccaagtg ccttttcctc agcactgagg 240
 gagggggett gtttcccttc cctcccggcg acaagctcca gggcaggget gtccctctgg 300
 graggecocker acttectes acaceactte treetgetge tecagtests grateates 360
 ettacecacc coccaagito aagascaaat ottocagetg coccettogi gittecetgi 420
 gtttgctgta gctgggcatg tctccaggaa ccaagaagcc ctcagcctgg tgtagtctcc 480
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  <211> 520
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  <213> Homo sapiens
  <400> 388
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  gittgaagat tgeetettet acagettetg agaattgigt tattteaett geeaagtgaa 180
  ggaccccttc cccaacatgc cccagcccac ccctaagcat ggtcccttgt caccaggcaa 240
  ccaggaaact getaettgtg gacetesees gagaecagga gggtttggtt ageteacagg 300.
  acttocccca coccagaaga tragcatocc atactagact catactcaac tcaactagge 360
  teataeteaa ttgatggtta ttagaeaatt eeatttettt etggttatta taaacagasa 420
  atettteete tteteattae eagtaaagge tettggtate titetgttgg aatgatttet 480
  atgaactigt citatitisa tggtgggttt titttctggt
                                                                     530
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  <211> 365
  <212> DNA
  <213> Homo eapiens
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 gagthaagge tegattteag atctgeetgg ttecageoge agtgtgeect etgeteecec 120
 aacgantite caaataatui caccagegee ttonagetoa ggegteetag aagegtette 180
 abgectatgg ceagetgtet ttgtgtteee teteaceege etgteeteae agetgagaet 240
 cecaggaaac etteagaeta eetteetetg eetteageaa ggggegttge ecacattete 300
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<223> n = A,T,C or G
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getetangag tetganenga ntegttgeet cantatgaca naaggaaagg cegasettat 180
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<21D> 391
<211> 325
<212> DNA
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<220>
<221> misc_feature
<222> (1)...(325)
<223> n = A,T,C or G
<400> 391
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tagecagge actgetgeca acagecagte constaccat catgtnacce ggtgngetet 180
naantingat ntccanagec ctacceaten tagttetget ctcccacegg ntaccagece 240
cantgoddag gaatoctada gedagtaedd tgtdddagg totdtaddta chagtaegat 300
gagacetecg getactacta tgace
<210> 392
<211> 277
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1) ... (277)
\langle 223 \rangle n = A,T,C or G
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antaccanga accgneatgn ettaanaacn neetggtetn tgggttnnte aatgaetgea 180
tgcagtgcac caccotgtcc actacgtgat gotgtaggat taxagtctca cagtgggcgg 240
ctgaggatec agcgccycgt cctgtgttgc tggggaa
c210 > 393
<211> 566
<212> DWA
<213> Homo sapiens
<400> 393
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traccadate cerricosa acestaces destruces correce recadades recadades 180
gagaaggtet agtttgteca teageattat catgatatea ggaetggtta ettggttaag 260
gaggggtcta ggagatetgt coettttaga gacacettae ttataatgaa gtatttggga 300
999t99tttt caaaagtaga aatgtootgt attoogatga toatcotgta aacattttat 360
 catthattaa teatecetge regigerat tattatatte atatetetae geiggaaact 420
ttctgcctca atgtttactg tgcctttgtt tttgctagtt tgtgttgttg aaaaaaaaa 480
 cattetetge etgagittta attittigice aaagttatti taatetatae aattaaaage 540
 ttttgcctat caaaaaaaaa aaaaaa
 <210> 394
 <211> 384
 <212> DNA
 <213> Nomo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(384)
 <223> n - A,T,C or G
 <400× 394
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 geaggaggae egggetetaa ggagttetaa getgagtgte actgtagaee ccaaatacca 180
 teccaagatt ategggagaa aggggggagt aattacecaa ateeggttgg agcatgaegt 240
 gascatcoag thtoctgats aggacgatgg gasccagecc caggaccasa ttaccatcac 300
 agggtacgaa aagaacacag aagctgccag ggatgctata ctgagaattg tgggtgaact 360
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tgagcagatg gtttctgagg acgt
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  <211> 399
  <212> DNA
  <213> Homo sapiene
  <400> 395
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  tetgacettg gaetecaaga ectacateaa cageetgget atattagatg atgagecagt 120
  tatcagaggt ttcatcattg eggaaattgt ggagtetaag gaaatcatgg cetetgaagt 180
  attracegtor trocagtace organitors tatagagity cotaacacan granating 240.
  ccagotactt gtotocaatt gtatottcaa.gaataccctg gccatccctt tgactgacgt 300
  caegttetet ttggsaagec tgggcatete etcaetacag acetetgace atgggaeggt 360
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 <210> 396
 <211> 403
 <212> DNA
 <213> Homo sapiens
 <22D>
 <221> misc_feature
 <222> (1)...(403)
 <223> n = A, T, C \text{ or } G
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 agacaaggac aacetgttee tteataaete tetagagaaa aaaaggagtt ettagtagat 180
 actemasana giggatgest eatriggats titticitae assgaticot igasscaret 240
 taggaaaatg gagggcctta tgatcagaat gctagaatta gtccattgtg ctgaagcagg 300
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 <211> 10D
 <212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(100)
\langle 223 \rangle n = A,T,C or G
<400> 397
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tecatecceg ctcctggttg gtnacagaat gactgacaaa
<210> 398
<211> 278
<212> DNA
<213> Homo sapiens
<220×
<221> misc_feature
<222> (1) ... (278)
<223> n = A,T,C or @
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<40D> 398
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teactactat accregacea atgaggagas etggacegae aacqaagatag acteateata 180
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ctatggccgc ttcattangt ggctcaacaa ggagaagg
<210> 399
<211> 298
<212> DNA
<213> Homo sapiens
<320>
<221> misc_feature
<222> (1)...(298)
\langle 223 \rangle n = A,T,C or G
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ggggtgccng catggagcgc atgggcgcgg gcctgggcca cggcatggat cgcgtgggct 120
cegagatega gegeatggge etggteatgg acceptaggg etcegtggag egeatggget 180
ceggrattga gegeatggge cegetgggee tegaceacat ggeetecane attganegea 240
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<210> 400
<211> 548
<212> DNA
<213> Homo sapiens
<400> 400
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Caeagaacca cacgcttaga agggtaagag ggcaccctat gasatgaast ggtgatttct 180
tgagtetett ttttccaegt ttaaggggcc atggcaggae ttagagttgc gagttaagac 240
tgcagagggc tagagaatta tttcatacag getttgaggc cacccatgte acttateccg 300
tataccetet caccatecce tigtetacte tgatgeccee aagatgeaac tgggcageta 360
gttggcccca taattctggg cctttgttgt ttgttttaat tacttgggca tcccaggaag 420
 ctttccagtg atctcctacc atgggccccc ctcctgggat caagcccctc ccaggccctg 480
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 zgcsggtt
 <210> 401
 <211> 355
 c212> DNA
 <213> Homo sapiens
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 <221> misc_feature
 <222> (1)...(355)
 <223> n = A, T, C or G
 <400> 401
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 taagagtggt ggcctatttc agctgctttg acaaaatgac tggctcctga cttaacgttc 100
 tataaatgaa tgtgctgaag caaagtgccc atggtggcgg cgaagaagan aaagatgtgt 240
 tttgttttgg actctctgtg gtcccttcca atgctgnggg tttccaacca ggggaagggt 300
```

```
cccttttgca ttgccaagtg coataaccat gagcactact ctaccatggn totgc
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   <210> 402
  <211> 407
  <212> DNA
  <213> Homo sapiens
  <230>
  <221> misc_feature
  <222> (1)...(407)
  <223> n = A, T, C or G
  <400> 402
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  totoacatgo ggtggcatac ataggotosa aataaaggaa tggagaaaaa tatttoaago 120
  assiggadaa cagaadaag caggigtige actochactt totgacaada cagachatge 180
  gaataaagat aaaaaagaga aggacattac aaaggtggtc ctgacctttg ataaatctca 240
  ttgettgata ceaacetggg etgttttaat tgeceaaace aaaaggataa tttgetgagg 300
  tegingaget tetercetge agagagtere igateterca agattigett gagatgiaag 360
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  <210> 403
  <211> 303
  <212> DNA
  <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1)...(303}
 4223> n = A,T,C or G
 <400> 403
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 tagagaacaa gacctactca gtcatgaaca aaaaggcaga caccaacatg gatctcatgg 180
 gggattggat attgtaatta tagagcagga agatgacagt gatcgtcatt tggcacaaca 240
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 gga
 <210> 404
 <211> 225
 <212> DNA
<213> Homo sapiens
<400> 404
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acatttteca ctcgtgtttc catagttgtt aagtgtatca gatgtgttgg gcatgtgaat 180
ctccaagtgc ctgtgtaata aataagtat ctttatttca ttcat
<210> 405
c2115 334
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(334)
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BUCDOCID: JAIO 0124000A0TI .

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<400> 405
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teatceccat eccatgeras aggassace tentecting getcacager tretetagge 180
ttoccagtge etreaggaca gagtgggtta tgttttcage tecatecttg ctgtgagtgt 240
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cactotocac tototoanng tggatocoac coot
<210> 406
c211> 216
<212> DNA
<213> Homo sapiens
<22D>
<221> misc_feature
<222> (1)...(216)
<223> n + A, T, C or G
<40D> 406
ttteatacet aatgagggag ttganatnae atnnaaceag gaaatgeatg gateteaang 60
gasacesacs cccaatasac toggagtggc agactgacas etgtgsgaca tgcacttgct 120
achaacaca astttnatgt tgcaccottg tttctacacc tgtgggttat gacaaagaca 180
actgocaaag aatnttcaag aaggaggact gocant
<210> 407
<211> 413
<212> DNA
<213> Homo sapiens
<400> 407
gotgacttgc tagtateate tecatteatt gaageacaag aactteatge citgacteat 60
gtesstgces taggattess essteestt gatatcacat ggasscagec assassatatt 120
gtacaacatt gcacccagtg tcagatteta cacctggcca ctcaggaagc aagagttaat 180
eccagagete tatetectaa tetetatee casateeate teatecacet accttcattt 240
ggammattgt catttgtccm tgtgacagtt gatacttatt cacatttcat atgggcaacc 300
Egccagacag gagaaagtet teccatgtta aaagacattt attatettgt ttteetgtca 360
tgggagttcc agaaaaagtt aaaacagaca atgggccagg ttctgtagta aag
 :210× 408
 c211> 183
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (183)
 \langle 223 \rangle n = A,T,C or G
 <400> 408
 ggaggtnggg gtcaattect coatnictat gitanestat tiaatgicti tignnatiaa 60
 tnettaacta getaateett aaagggetan neateetta actagteest esattgegag 120
 cattatectt ccagtatten cettetnttt tatttactee tteetggeta eccatgtact 180
                                                                    183
 <210> 409
 <211> 250
```

```
<212> DNA
  <213> Homo sapiens
  <220>
  <221> misc_feature
  <222> (1)...(250)
  <223> n = A,T,C or G
  <400> 409
 eccacgcatg ataagetett tatttetgta agteetgeta ggaaateate aaatetgaeg 60
 grantingg ggarctgeac esacctectg taattaates gettteagtt teteccente 120
 greeteett caacaacata ggaggateet erecttettt etgeteacgg cettatetag 180 ;
 getteeeagt geeccagga cagegtggge tatgtttaca gegenteett getgggggg 240
 ggcontatgo
 <210> 410
 <211> 306
 <212> DMA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> {1}...(306)
 \langle 223 \rangle n = A,T,C or G
 <400> 410
 ggctggtttg caagaatgaa atgaatgatt ctacagctag gacttaacct tgaaatggaa 60
 agtettgeaa teccatttge aggateegte tgtgeacatg cetetgtaga gageagcatt 120
 cccagggace ttggaaacag ttggcactgt aaggtgettg etecccaaga cacatectaa 180
 auggrattet autgergess seegetteet tetttatte ceettettat tratetesse 240
nactggttgg cttttttgm atcttttta aactggaaag tteaattgmg aaaatgaata 300
 tentge
 <210> 413
 <211> 261
 <212> DNA
 <213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A, T, C \text{ or } G
<400> 411
agagatatin citagginaa agitcataga gitcocatga actatatgac iggccacaca 60
ggatettttg tatttaagga ttetgagatt ttgettgage aggattagat aaggetgtte 120
tttaaatgto tgaaatggaa cagatttcaa aaaaaaacco cacaatctag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caassaacca atttacccat cagttccage 240
cttctctcaa ggngaggcaa a
                                                                    261
<210> 412
<211> 241
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(241)
```

```
<223> D = A,T,C or G
<400> 413
gttcaatgtt acctgacatt totacaacac cocactcacc gatgtattcg ttgcccagtg 60
ggaacatacc agentgaatt tggaassaat aattgtgttt ettgeceagg saatsetacg 120
actgactttg atggctccac aaacataacc cagtgtaaaa acagaagatg tggagggag 180
ctgggagatt teactgggta cattgaatte ecasactace cangeastta cecagecase 240
c210> 413
c211> 231
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> |1)...(231)
<223> n = A,T,C or G
<400> 413
ascidtada atocasgiga cicalcigig igcligasic citicaectg intestecc 60
rtcatccaag titctagtar citctctitg tigigaagga taatcaaact gaacaacaaa 120
aagtttaete teeteattig gaacetaaaa actetettet teetgigtet gagggeteea 180
agaateettg aateanttet cagateattg gggacacean atcaggaace t
<210> 414
<211> 234
<212> DNA
<213> Homo sapiena
<400> 414
actificoate angenetigne cagangeties adscarates careagacae tempasesas 60
gatggagetg assacstase cesetetgte etggaggese tgggasgeet agagasgget 120
gtgagecaag gagggagggt etteetttgg catgggatgg ggatgaagta aggagaggga 180
etggaccee tggaagetga ttcaetatgg gggaggtgt attgaagtee teea
<210> 415
<211> 217
 <212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
 <222> (1)...(217}
<223> n = A,T,C or G
<400> 415
goataggatt aagactgagt atcttttcta cattcttta actttctaag gggcacttct 60
caatacacag accaggtage asstctccac tgctcLaagg ntctcaccac cactttctca 120
carctageaa tagtagaatt cagteetact tetgaggeea gaagaatggt teagaaaat 190
 entggattat aaasaatsac sattaagaas aatsatc
 <210> 416
 <211> 213
 <212> DNA
 <213> Romo sapiens
 <220>
```

```
<221> misc_feature
   <222> (1)...(213)
   <223> n = A,T,C or G
   <400> 416
  atgratatni aaagganact gootogotti tagaagacat otggnotgot ototgoatga 60
  ggcacagcag taxagetett tgatteecag aatcaagaac teteceette agactattac 120
  ogaatgcaag gtggttaatt gaaggecact aattgatgct caaatagaag gatattgact 180
  atattggaac agatggagtc tctactacaa aag
  <210> 417
  <211> 303
  <212> DNA
  <213> Homo sapiens
  <220>
  <221> misc_feature
  <222> {1}...(303)
  \langle 223 \rangle n = A,T,C or G
  c400> 427
 nagtetteng gecentengg gaagttenen etggagagna gtentacata tgtaetgtat 60
 gtgggaaagg ctttactctg agttcaaatc ttcaagccca tcagagagtc cacactggag 120
 agaagecata caaatgcaat gagtgtggga agagetteag gagggattee cattateaag 180
 ttratrtagt ggtcracaca ggagagaac crtateaatg tgagatetgt gggeegggt 240
 trantraaag tiegtatett caaatecate ngaaggneea cagtatanan aaacettita 300
 agt
                                                                     303
 <210> 418
 <211> 328
 <212> DNA
 <213> Homo sagiens
 <230>
 <221> misc_feature
 <222> (1)...(328)
 <223> n = A, T, C or G
 <400> 418
 tttttggcgg tggtgggce gggecgggec engagtotca ctctgttgcc caggctggag 60
tgcacaggca tgatctcggc tcactacaac ccctgcctcc catgtccaag cgattcttgt 120
geeteageet teeetgtage tagaattaca ggeacatgee accaeaceea getagttttt 180
gtatttttag tagagaragg gtttracrat gttggcragg ctggtrtcaa actcctnacc 240
teagnggtea ggetggtete saarteetga eetcaagtga tetgereace teageetece 300
aaagtgetan gattacagge egtgagee
<210> 419
<211> 389
<212> DNA
<211> Homo sapiens
<22D≥
<221> misc_feature
<222> {1}...(389)
<223> n = A, T, C or g
<400> 419
cetecteaag acggeetgtg gteegeetee eggeaaceaa gaageetgea gtgeeatatg 60
```

PCT/U800/30904

```
acceptage catagertes agenteses greatestack contented gatettects 120
ettettert etelgigget ceatteatag cacagitgit gesetgagge tigtgeagge 180
cgagcaaggc caagctggct caaagagcaa ccagtcaact ctgccacggt gegccaggca 240
erggttetec agecaceaac etcacteget ecegeaaatg geacateagt tettetacec 300
teaaggtagg accaaagggc atctgctttt ctgaagtcct ctgctctatc agccatcacg 360
tggcagccac tenggetgtg tegacgcgg
<210> 420
c211> 40B
<212> DNA
<213> Romo sapiens
<400> 420
gttecteeta aetectgeca gaaacagete tecteaacat gagagetgea eccetectee 60
tggccagggc agcaagcett agcettgget tettgtttet gettttttte tggctagace 120
gaagtgtact agccaaggag tigaagtitg tgactitggt gtiteggcat ggagaccgaa 180
gtreeattga caretttere artgarecca taamggaate etcatggeca caaggatttg 240
gccaactcac ccagetegge atggagcage attatgaact teggagagtat ataagaaaga 300
gatatagasa attotogaat gagtootata aacatgasca ggtttatatt ogaagcacag 360
acgetgaccy gactttgaty aagtoctato acaeacutgy caageccy
<210> 421
<211> 352
<212> DNA
 <213> Homo sapiens
<220>
 <221> misc_feature
 <222> {1}...(352)
 <223> n = A,T,C or 0
 c400> 421
 geteaaaaat ettettaetg atnggeatgg etacacaate attgaetatt aeggaggeea 60
 gaggagaatg aggeetggee tgggageect gtgeetaeta naageacatt agattateea 120
 ttcactgaca gaacaggtet tttttgggte cttettetee accaenatat acttgeagte 180
 ctccttcttg aagattcttt ggcagttgtc tttgtcataa cccacaggtg tagaaacaag 240
 ggtgcaacat gaaatttetg tttcgtagca agtgcatgtc tcacaagttg gcangtctgc 300
 cacteogagt thattgggtg titgttteet tigagateea tgeattfeet gg
 <210> 422
 <211> 337
 <212> DNA
 <213> Homo sapiens
 <400> 422
 atgocardat gotggdaatg cagogggogg togaaggdot goatatooag occaagotgg 60
 cgatgatcga cggcaaccgt tgcccgaagt tgccgatgcc agccgaagcg gtggtcaagg 120
 gcqatagcaa ggtgccggcg atcgcggcgg cgtcaatcct ggccaaggtc agccgtgatc 180
 gtgasatggc agetgtegas ttgatetace egggttatgg categgeggg cataaggget 240
 atecgaeace ggtgcaectg gaageettge ageggetggg geogaegeeg atteacegae 300
 gettetteeg ceggtaogge tggeetatga aaattat
 <210> 423
 <211> 310
  <212> DWA
  <213> Homo Bapiena
  <220>
```

```
<221> misc_feature
   <222> (1)...(310)
   <223> n = A, T, C or G
   c400> 423
  geteaaaaat etttttaetg atatggeatg getacacaat cattgaetat tagaggeeag 60
  aggagaatga ggeetggeet gggageeetg tgeetactan aageneatta gattateeat 120
  tractgacag aacaggtett tttttgggtee ttetteteea coacgatata ettgeagtee 180
  teettettga agattetteg geagttgtet tegtestaan ceacaggtgt anasacaagg 240
  gtgcaacatg asatttctgt ttcgtagcaa gtgcatgtct cacagttgtc asgtctgccc 300
  tccgagttta
  <210> 424
  <211> 370
  <212> DNA
  <213> Homo sapiens
  <220>
  <221> misc_feature
  <222> (1),...(370)
  <223> n = A,T,C or G
  <400> 424
 geteaaaaat etttttaetg ataggeatgg etacacaate attgaetatt agaggeeaga 60
 ggagaatgag gootggootg ggagecotgt gootactaga agcacattag attatecatt 120
 cactgacaga acaggictti tittgggtect tettetecae caegatatae tigeagteet 180
 ecttettgaa gattetttgg cagttgtett tgteataace eacaggtgta gaaacateet 240
 gettgaatet eelggaarte cetcattage latgasstag catgalgeat tgcataaset 300
 racgaaggtg gcaaagatca caacgctgcc cagganaaca ttcattgtga taagcaggac 360
 teegtegacq
 c210> 425
 <211> 216
 <212> DNA
 <213> Homo sapiens
 <220×
 <221> misc feature
 <222> (1)...(216)
 <223> n - A,T,C or G
 <400> 425
aattgctatn nttlattttg ccactcaaaa taattaccaa aaaaaaaaa intraaatga ab
taacsacnea acateaaggn aaananaaca ggaatggntg actntgcata aatnggeega 120
anattateca ttaintiaag ggitgaette aggntacage acacagacaa acatgeccag 180
gaggnentca ggacogeteg atgententg aggagg
<210> 426
<211> 596
<212> DNA
<213> Homo sapiens
<400> 426
cttccagtga ggataaccet gttgccccgg gccgaggtte tccattagge tctgattgat 60
tageagteag Egatggaagg gtgEtetgat catteegact geoccaaggg tegetggeea 120
getetetgtt tigetgagtt ggeagtagga estaatitgt taattaagag tagatggtga 180
getgteettg tattttgatt aacetaatgg cetteerage acgaetegga tteagetgga 240
gacatcacgg caacttttaa tgaaatgatt tgaagggcca ttaagaggca cttcccgtta 300
```

```
ttaggcagtt catctgcact gataacttct tggcagctga gctggtcgga getgtggccc 360
asacgcacac teggettete gttttgagat acaactetta atettttagt catgettgag 420
ggtggatggc cttttcagct ttaacccaat ttgcactgcc ttggaagtgt agccaggaga 480
atacactcat atactogtgg gottagaggd cacagosgat gtoattggte tactgcctga 540
gtoccgctgg toccatecca ggacctteca toggegagta cetgggagec cgtgct
<210> 427
<211> 107
<212> DNA
<213> Homo sapiens
<22B>
<221> misc feature
<222> {1}...(107)
<223> n = A,T,C or G
<400> 427
gazgaattez agttaggttt attesaaggg ettaengaga ateetanaee ezggneeesg 60
conggrages goettanaga gotcotottt gactoroog otcagno
<210> 428
<211> 38
<212> DNA
<213° Homo sapiena
<220>
 <221> misc feature
 <222> (1)...(38)
 \langle 223 \rangle n = A,T,C or G
 <400> 428
                                                                    ЭB
 gaactteena anaangaett tatteaetat titaeatt
 <210> 429
 <211> 544
 <212> DNA
 <213> Homo sapiens
 <400> 429
 etttgetgga eggaataaaa gtggaegcaa geatgaeete etgatgaggg egetgeattt 60
 attgaagage ggetgeagee etgeggttea gattaaaate egagaattgt atagaegeeg 120
 atatecaega actottgaag gaetttetga titatecaea ateaaateat eggitticag 180
 tttggatggt ggeteateac etgtagaace tgaettggee gtggetggaa tecaetegtt 240
 geottecaet teagttacae eteacteace atectetect gttggttetg tgetgettea 300
 agatacteeg corecattig agatgoagoe greatetree reaattooto rigicoatre 360
 tgatgtgcag ttamasaatc tgccctttta tgatgtcctt gatgttctca tcaagcccac 420
 gagtttagtt caaagcagta tteagcgatt teaagagaag ttttttattt ttgetttgar 480
 acctcaacaa gttagagaga tatgcatate cagggatttt ttgccaggtg gtaggagaga 540
 ttat
 <210> 430
 c211> 5D7
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
  <222> (1) ... (507)
```

```
<2235 n = A, T, C or G
   <4005 430
  ettatenesa tggggeteee saaettgget gtgeægtgga aaeteegggg gaattttgaa 60
  gaacactgac acceatotto cacceegaca ctetgattta attgggetgc agtgagaaca 120
  gageateaat ttaaaaaget geeragaatg tinteetggg cagegitgig ateitigeen 180
  cettegtgae titatgeaat geateatget attteatace taatgaggga giteeaggag 240
  atteaaceag gatgttteta enectgtggg ttatgacaaa gacaactgcc aaagaatntt 300
  caagaaggag gactgcaagt atatcgtggt ggagaagaag gacccaaaaa agacctgttc 360
  tytoagtgaa tygataatot aatytyotto tagtaggcac agggeteeca gyccaggest 420
  cattofcoto tggcototas tagicastga ttgtgtagco atgcotatoa gtasasagat 480
  ttttgagcaa aassassas assassa
  <210> 431
  <211> 392
  <212> DNA
  <213> Homo sapiens
  <220>
  <221> misc_feature
  <222> (1)...(392)
  <223 > n = A,T,C or G
 <400> 431
 gaaaattoag aatggataaa aacaaatgaa gtacaaaata tttoagattt acatagogat 60
 asacaagaaa gesettatea ggaggaetta esaatggaag tacactetan aaccateste 120
 tatcatggct aaatgtgaga ttagcacage tgtattattt gtacattgca aacacctaga 180
 aagagatggg aaacaaaatc ccaggagttt tgtgtgtgga gtcctgggtt ttccaacaga 240
 catcattoca geattetgag attagggmga ttggggatca ttetggagtt ggaatgttea 300
 acaaaagtga tgttgttagg taaaatgtac aacttctgga tctatgcaga cattgaaggt 360
 gcaatgagto tggottttae totgotgttt ot
 <210> 432
 <211> 387
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc feature
 <222> (1)...[387]
<223> n = \lambda, T, C or G
<400> 432
ggtateenta cataateaaa tatagetgta gtacatgttt teattggngt agattaceae 60
seatgreagg cascatgigt agaictetig tellettett tigicials tactgialig 120
ngtagtrcaa geteteggna gtecagecae tgngaaacat getecettta gattaacete 180
gragaenetn tigitgnatt gretgaactg tagngeeetg tattitgett etgretgnga 240
attetgttge ttetggggea ttteettgng atgeagagga ceaccacae gatgacagea 300
atotgaattg ntecaateac agetgegatt aagacatact gaaategtac aggaceggga 360
acaacgtate gaecactgga gtccttt
<210> 433
<211> 281
<212> DWA
<213> Homo sapiens
<220>
<221> misc_feature
```

```
<222> (1) ... (281)
<223> n = A,T,C or G
<40D> 433
tteaactage anagaanact getteagggn gtgtaaaatg aaaggettee acgeagttat 60
ctgattaaag aacactaaga gagggacaag gctagaagcc gcaggatgtc tacactatag 120
caggenetat ttgggttgge tggaggaget gtggaaaaca tggagagatt ggegetggag 180
etegeegtgg ctatteeten tigntaltae accagngagg nietetgint geecectegt 240
tmmaaaaccg ntatacaata atgatagaat aggacacaca t
<210> 434
<211> 484
<212> DNA
<213> Homo sapiens
<400> 434
tittaaaata agcatttagt geteagteer tactgagtae tettietete eesteetetg 60
matttaattc tttcmacttg camtttgcam ggattacaca tttcactgtg migtatattg 120
tgttgcaaaa aaaaaaaagt gtetttgttt aaaattaett ggtttgtgaa tecatettge 180
titticecca (tiggaactag teattaacce atetetgaac tigtagaaaa acatetgaag 240
agctagteta teageatetg acaggtgaat tggatggtte teagaaceat tteaccaga 300
cagootyttt ctatootytt taataaatta gtttgggttc totacatgca taacasaccc 360
tgetecaate tgteacataa aagtetgtga ettgaagttt agteageace cecaccaaac 420
titattttte tatgtettt tigcaacata teagtetttt gaaaataaag tacccatete 480
ttta
<210> 435
<211> 424
<212> DNA
<213> Romo sapiens
<400> 435
gegeogetea gageaggtea etttetgeet tecaegteet eetteaagga ageeceatgt 60
gggtagettt caatategea ggttettaet cetetgeete tataagetea aacecaceaa 120
cgatcgggea agtaaacccc ctecctcgcc gacttcggaa ctggcgagag ttcagcgcag 180
atgggcctgt ggggaggggg caagatagat gagggggagc ggcatggtgc ggggtgaccc 240
 ettggagaga ggaaaaagge cacaagaggg getgeeaceg ceactaacgg agatggeeet 300
ggtngagace tttgggggte tggaacetet ggacteecca tgetetaact cecacactet 360
 getateagaa anttaaaett gaggatttte tetgttttte actegeaata aatteagage 420
BBBC
 c210> 436
 c211> 667
 <212> DNA
 <213> Homo sapiena
 <220>
 <221> misc feature
 <222> {1}...(667)
 <223> n = A,T,C or G
 <400> 436
 accttgggaa nacteteaca atataaaggg tegtagaett tacteeaaat teeaaaaagg 60
 teetggeest gtaateetga aagtetteee aaggtageta taaasteett ataagggtge 120
 agoctottot ggaattooto tgatttoaaa gtotoactot caagttottg aaaacgaggg 180
 cagtteetga aaggeaggta tageaactga tetteagaaa gaggaactgt gtgeaceggg 240
 atgggetgee agagtaggat aggatteeag atgetgacae ettetggggg aaacaggget 300
 gecaggittg testageact catesaagte eggteamegt etgtgetteg astatasace 360
```

```
tgttcatgtt tataggacte attcaagaat tttctatate tetttettat atacteteca 420
  agttcataat getgetedat geceagetgg gtgagttgge caaateettg tggccatgag 480
  gatteettta toggeteagt gegeaagete teaatgeget ttegetetee atgeepaeae 540
  accaaagtea caaacttcaa ctccttgget agtacactte ggtetageca gaaaaaaage 600
  Agaaacaagga agccaaggat aaggattgat gccatgacag gaggaggggt gcagatataa 660
  tgttgag
  <210> 437
  <211> 693
  <212> DNA
  <213> Homo sapiens
  <400> 437
  chacytetea acceteattt traggraagg astertaagt cesaagstat tasgrgaete so
  acacagecag graaggaaag etggattgge acactaggae tetaceatae egggttttgt 120
  taaageteag gttaggagge tgataagett ggaaggaaet teagaeaget tttteagate 180
  ataaaagata attettagee catgitette tecagageag acetgaaatg acagcacage 240
  aggtactect etatttteac coctettget tetactetet ggeagteaga eetgtgggag 300
 gccatgggag aaagcagete tetggatgtt tgtacagate atggactatt etetgtggac 360
 cattleteca ggttacceta ggtgteacta ttggggggac agceageate tttagettte 420
 atttgagttt ctgtctgtct tcagtagagg asscttttgc tcttcacact tcacatctga 480
 acacctaact gctgttgctc ctgaggtggt gaaagacaga tatagagctt acagtattta 540
 tectatttet aggeactgag ggetgtgggg tacettgtgg tgccasaaca gateetgttt 600
 taaggacatg ttgcttcaga gatgtctgta actatctggg ggctctgttg gctctttacc 660
 ctgcatcatg tgctctcttg gctgaaastg acc
 <210> 438
 <211> 360
 <212> DNA
 <213> Homo sapiens
 <400> 438
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 ttatgeaatg catcatgeta tttcatacct aatgagggag ttccaggaga ttcaaccagg 120
 atgittetae acetgigggi talgacasag acaacigees aagaalette aagaaggagg 180
 actgcaagta tatctggtgg agaagaagga cccaaaaaag acctgttctg tcagtgaatg 240
 gataatetaa tgtgetteta gtaggeacag ggeteecagg ecaggeetea tteteetetg 300
geetetaata gteaataatt gtgtageeat geetateagt aaaaagattt ttgageaaac 360
<210> 439
<211> 431
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G
<400> 439
gttcctnnta actcctgcca gaaacagctc tecteaacat gagagctgca eccetectec 50
tggccagggc agcaagcett agcettgget tettgtttet getttttte tggctagace 120
gaagtgtact agccaaggag tigaagiitg tgactiiggi giitoggcai ggagaccgaa 180
gtoccattga cacetttece actgaececa taaaggaate etcatggeea caaggatttg 240
greaactcac reagetggge atggageage attatgaact tggagagtat ataagaaaga 300
gatatagasa attettgaat gagteetata aacatgaaca ggtttatatt egaageacag 350
acgttgaccg gactttgatg agtgetatga caaacetgge agecegtega egoggeogeg 420
aatttagtag t
```

DISCOUNTING AND ASSESSMENT -

```
<210> 440
<211> 523
<212> DNA
c213> Homo sapiens
<600> 440
agagatasag ettaggtesa agttestaga gtteecatga actatatgae tggeescaes 60
ggatottttg tatttaagga ttotgagett Etgottgage aggattagat aaggotgtte 120
titaaatgte tgaaatggaa cagattteaa aasaasacee caesatetag ggtgggaaca 180
aggaaggaaa gatgtgaata ggctgatggg caaaaaacca atttacccat cagttccagc 240
cttctctcaa ggagaggcaa agaaaggaga tacagtggag acatctggaa agttttctcc 300;
actggaaaac tgctactate tgtttttata tttctgttaa aatatetgag gctacagaac 360
taamaattaa aacctotttg tgtcccttgg tcctggaaca tctatgttcc ttttaaagsa 420
aceasaatra sectttareg saagatttga tgtetgtaat acatatagca getettgaag 480
tatatatato atagozaata agtoatotga tgagaacaag ota
<210> 441
<211> 43D
<212> DNA
<213> Homo sapiens
<400> 441
gitectecta acteobgeca gaaacagete teeteaacat gagagetgea eccetectee 60
togocagage agezageett ageettaget tettattet gettettet tagetagace 120
gaagtgtact agccaaggag ttgaagtttg tgactttggt gtttoggcat ggagaccgaa 180
gteccattga caeettteee actgaceeca taaaggaate eteatggeea caaggatttg 240
gecaacteac ceagetggge atggageage attatgaact tggagagtat ataagaaaga 300
gatatagasa attettesast gagicetata aacatgasca ggittatati egaageacag 360
acgttgaccg gactttgatg agtgctatga caaacetggc agccogtcga cgcggccgcg 420
aatttagtag
<210> 442
<213> 362
<212> DNA
<213> Homo sapiens
ctaaggaatt agtagtgttc ccatcacttg tttggagtgt gctattctaa aagattttga 60
tttcctggaa tgacaattat etttteactt tggtgggga asgagttate ggaceacagt 120
cttcacttct gatacttgta aattaatctt ttattgcact tgttttgacc attaagctat 180
atgittagaa atggiteatit taeggaaaaa ttagaaaaat tetgataata gigeagaata 240
antgaattaa tettttactt aatttatatt gearteteaa teareaataa aaattrette 300
tgattatttt ttgttttcat ttaccagast asaasctaag asttaasagt ttgattacag 360
tc
 <210> 443
 <211> 624
 <212> DNA
 <213> Homo sapiens
 <220>
 <221> misc_feature
 <222> (1) ... (624)
 <223> n = A,T,C or G
 <400> 443
 tttttttttt gcaacacaat atacatcaca gtgaaatgtg taatccttgc aaattgcaag 60
```

```
ttgaaagaat taaatt¢aga ggagggaga gaaagagtac tcagtaggga ctgagcacta 120
  aatgettatt ttaasagasa tgtaaagage egsaageaat teaggetace etgeettttg 180
  tgetggetag tactceggte ggtgtcagca gcacgtggca ttgaacattg caatgtggag 240
  eccasaccac agasastggg gtgsasttgg ccasctttct attasettgg #ttcctgttt 300
  tataaaatat tgtgaataat atcacctact tcaaagggca gttatgaggc ttaaatgaac 360
  taacgcetae aaaacaetta aacatagata acataggtge aagtactatg tatetggtae 420
  atggtaaaca teettattat taaagteaac getaaaatga atgtgtgtge atatgetaat 480
  agtacagaga gagggcactt asaccaacta agggcctgga gggaaggttt cctggaasga 540
  ngatgettgt getgggteea aatettggte tactatgace tiggeesaat tatttaaet 500
  tigicectat cigctaaaca gate
  <210> 444
  <211> 425
  <212> DNA
  <213> Homo sapiena
 <220>
 <221> misc_feature
 <222> (1)...(425)
 <223> n = A_1T_1C \text{ or } G
 <400> 444
 gcacateatt nntettgeát tetttgagaa taagaagate agtaaatagt teagaagtgg 60
 gaagettigt eeaggeetgt gigtgaacee aatgilitige tiagaaatag aacaagtaag 120
 tteattgeta tageataaca caaaatttge ataagtggtg gteageaaat cettgaatge 180
 tgettaatgt gagaggttgg taaaateett tgtgeaacac tetaaeteee tgaatgtttt 240
 getgtgetgg gacetgtgea tgecagaeaa ggecaagetg getgaaagag caaccageca 300
 cetetgeaat etgecarete etgetgecas gatttgtttt tgeateetgt gaagagecaa 360
 ggaggcacca gggcataagt gagtagactt atggtcgacg cggccgcgaa tttagtagta 420
 gtaga
 <210> 445
 <21.1> 414
 <212> DNA
 <213> Homo sapiens
 c2205
 <221> misc_feature
 <222> (1)...(414)
 <223> n - A,T,C or G
<400> 445
catgittaig nittiggatt actitgggca cctagigtti claaategic taicaticit so
ttctgttttt casaagcaga gatggccaga gtctcaacaa actgtatctt caagtctttg 120
tgaaattett tgeatgtgge agattattgg atgtagttte etttaaetag eatataaate 180
tggtgtgttt cagataaatg aacagcaaaa tgtggtggaa ttaccatttg gaacattgtg 240
aatgaaaaat tgtgteteta gattatgtaa caaataaeta ttteetaaee attgatettt 300
ggattittat aatoctacke acaaatgaet aggettetee teltgtattt tgaageagtg 360
toggtgetgg attgatesas assassas tegsegegge egegsattta gtag
<210> 446
<211> 631
<212> DNA
<213> Homo sapiens
<220>
<221> misc_feature
<222> (1)...(631)
```

```
c223 > D = A,T,C \text{ or } G
<400> 446
acsaettage anesagtgoc agagsaceco acatacottg tooggascat tacsatggot 60
totgoatgca tgggaagtgt gagcattota toaatatgca ggagcoatot tgcaggtgtg 120
atgotggtta tactggaces cactgtgaas sassggacta cagtgttcta tacgttgttc 180
construction adjetitions tatgetetas togoagetet gattegases attempatty 240
centrater totogete ceregoate caagggeeaa actteaggta atagcategg 300
actgagatti graaacttte caacetteca ggaaatgeee cagaagcaac agaatteaca 360
gacagaagca aaatacaggg cactacagtt cagacaatac aacaagagcg tccacgaggt 420
taatetaaag ggagcatgtt teacagtgge tggactaceg agagettgga etacacaata 480
cagtattata gacasaagaa taagacaaga gatctacaca tgttgccttg catttgtggt 540;
aatctacacc aatgaaaaca tgtactacag ctatatttga ttatgtatgg atatatttga 600
aatagtatac attgtcttga tgttttttct g
c210> 447
<211> 585
<212> DNA
<213 > Homo sapiens
<220>
<221> misc_feature
<222> (1)...(585)
<223> n = A,T,C or G
<400> 447
cottaggass anthtraces tetesagget catagactit actorsesti cossessaget 60
cotggocatg taatootgaa agttttocca aggtagotat aaaatcotta taagggtgea 120
gootettotg gaatteetet gattteaaag teteactete aagttettga aaacgaggge 180
agtteetgaa aggeaggtat ageaactgat etteagaaag aggaactgtg tgeaceggga 240
tgggctgcca gagtaggata ggattccaga tgctgacacc ttctggggga aacagggctg 300
ccaggitigt catagoacto atcaaagico ggicaacgio igigolioga ataissacci 360
gtteatgttt ataggaetea tteaagaatt ttetatatet etttettata taeteteeaa 420
gttoataatg etgetecatg cocagetggg tgagttggcc aaatcettgt ggccatgagg 480
attectttat ggggteagtg ggaaaggtgt caatgggact teggteteca tgccgaaara 540
ecamagicae amacticame tectiggeta glacaciteg gieta
<210> 448
<211> 93
<212> DNA
edites cample <213>
<220>
<221> misc_feature
<222> (1)...(93)
<223> n = A, T, C or G
<400> 448
tgctcgtggg tcattctgan nnccgaactg accntgccag ccctgecgan gggccnccat 60
ggeteectag tgeectggag aggangggge tag
<210> 449
<211> 706
<212> DNA
<213> Homo sapiens
<220>
<221> misc feature
```

```
<222> (1)...(706)
  <223> n = A,T,C or g
  <400> 449
 ccaagtteat geintgiget ggacgeigga caggggeaa aagemnitge iegigggica 60
 ttotgancac egaactgace atgecagece tgccgatggt cetecatgge tecetagtge 120
 cetqgagagg aggtgtetag teagagagta gteetggaag gtggeetetg ngaggageea 180
 eggggacage atoctgeage togtenggen egternatte genattengg etgreenant 240
 strassas acastcadta cadaceter cacrered cosaccaded aveadadast 300
 gtgctgcaag gcgattaagt tgggtaacgc cagggttttc ccagtoncga cgttgtaaaa 360
 cgacggecag tgaattgaat ttaggtgacn etatagaaga getatgacgt egcatgeacg 420
 egtacgtaag etteggateet etagagegge egeetactae tactaaatte geggeegegt 480
 ceaceteges techeactes gagagtegag agtgacetet getggachet gtecatgeag 540
 cactgagcag aagetggagg cacaacgene cagacactea cagetactea ggaggetgag 600
 aacaggttga acctgggagg tggaggttgc aatgagctga gatcaggccn ctgcncccca 660
 gcatggatga cagagtgada etcoatetta asaaasasaa asaaaa
 <210> 450
 <211> 493
 <212> DNA
 <213> Homo sapiene
 <400> 450
 gagacqgagt gtcactctgt tgcccaggct ggagtgcagc aagacactgt ctaagaaaaa 60
 acagtittee enggtaeeac aacetaaaaa gaaatatoot ategtggaaa taegagegto 120
 anatgagget gaganettta canagggate ttacagacat gtegecanta teactgeatg 180
 ageetaagta taagaacaac etttggggag aaaecateat ttgaeagtga ggtaeaatte 240
 cesgtcaggt agtgaaatgg gtggaattaa actcasatta atcctgccag ctgaaacgca 300
 agagacactg tcagagagtt aaamagtgmg ttctatccat gaggtgattc cacagtcttc 360
 toaagteaac acatetgtga acteacagae caagttetta aaccaetgtt caaactetge 420
 tacacateag aatcacetgg agagetttae aaacteecat tgeegagggt egaegeggee 480
gcgaatttag tag
<210> 451
<211> 501
<212> DNA
<213> Homo sapiens
<220×
<221> misc_feature
<222> (1)...(501)
<223> n = A,T,C or G
<400> 451
99909cgtcc cattcgccat tcaggctgcg caactgttgg gaagggcgat cggtgcgggc 60
ctettegeta ttacgecage tggcgaaagg gggatgtget gcaaggegat taagttgegt 120
aacgccageg tttleccagt chceacgtte taaaaceacg gccagtgaat tgaatttage 180
tgaemetata gaagagetat gacgtegeat geacgegtae gtaagettgg atcetetaga 240
geggeegeet actactacta aattegegge egegtegaeg tgggateene actgagagag 300
tggagagtga catgtgctgg acnotgtoca tgaagcactg agcagaagct ggaggcacaa 360
cgcnccagac actcacaget actcaggagg ctgagaacag gttgaacctg ggaggtggag 420
gitgeaatga getgagatea ggeenetgen ecceageatg gatgaeagag tgaaacteea 480
tettaasaaa aaaaaaaaaa a
                                                                  501
<210> 452
<211> 51
<212> DNA
<213> Romo sapieng
```

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```
<220>
<221> misc feature
<222> (1)...(51)
<223> n = A,T,C or G
<400> 452
agacggtttc accnttacaa cnccttttag gatgggnntt ggggagcaag c
                                                                  51
<210> 453
<211> 317
<212> DNA
<213> Komo gapiens
<220≻
<221> misc feature
<222> (1)...(317)
<223> n = A,T,C or G
<400> 453
tacatottgo titttcccca tiggaactag toattaacco atototgaac tggtagasaa 60
acatotgaag agctagtota toagcatotg gcaagtgaat tggatggtto toagaaccat 120
tteacceans cageotyttt ctatectytt taataaatta gtttgggtte tetacatgea 180
taacaaaccc tootecaatc totcacataa aagtetotoa ettoaagtet antcagcacc 240
cccaccaasc titatitic tatgigitti tigcsacata igagigitti gassataagg 300
tacccatgtc tttatta
<210> 454
<211> 231
<212> DNA
<213> Homo sapiens
<400> 454
ttcgaggtac aatcaactot cagagtgtag tttccttcta tagatgagtc agcattaata 60
teaporarge cargetetty asygagetett gastteteet regressets agtagaaces 120
agaagaccaa attettetge atcccagett gcaaacsaas tigitettet aggieteeac 180
ectteettt teagtgitee aaageteete acaatticat gaacaacage t
<210> 455
<211> 231
<212> DNA
<213> Home sapiens
<400> 455
taccasagag ggcataataa teagteteac agtagggtte accatectee aagtgaaaaa 60
cattettece aateggettt coacageta cacacacaaa acageaaaca teccaaettt 120
gtttcaacge attgatgact tetccaagga tettcetttg geatcgacca cattcagggg 180
caeagaattt ctcatagcac ageteaceat acagggetee tttetectet a
<210> 456
<211> 231
<212> DWA
<213> Homo sapiens
c400> 456
ttggraggta occitacaaa qaagacacca taccitatge gitattaggi ggaataatca 6D
ttocattoag tattatogtt attattottg gagaaaccot gtotgtttac tgtaaccttt 120
tgcactcaaa ttcctttatc aggestaact acatagccac tatttacaaa gccattggaa 180
```

```
cotttttatt tggtoceget gotagtcagt cootgactga cattgccaag t
                                                                    231
 <210> 457
 <211> 231
 <212> DNA
 <213> Homo sapiens
 <220×
 <221> misc_feature
 <222> (1)...(231)
 <223> n = A,T,C or G
 <400> 457
 cyaggtaccc aggggtetga asstetetnn tetantagte gatagessa tegetestes 60
 gcatteetta atatgatett getataatta gatttttete cattagagtt catacagttt 120
 tatttgattt tattageaat etettteaga agaceettga gateattaag etetgtatee 180
 agitgictaa ategatgeet catttectet gaggigtege iggettiige g
                                                                   231
 <210> 458
 <211> 231
 <212> DNA
 <213> Homo sapiens
 <400> 459
 aggictggtt coccoractt coactococt ctactototo taggactggg ctggggcpag aD
 agaagagggg tggttaggga agccgttgag acctgaagcc ccaccctcta ccttccttca 120
 acaccetaac ettgggtaac agcatttgga attateattt gggatyagta gaattteeaa 180
ggteetgggt taggeatttt ggggggeeag acceeaggag aagaagatte t
 <210> 459
 <211> 231
 <212> DNA
<213> Homo sapiena
<400> 459
ggtaccgagg ctcgctgaca cagagaaacc ccaacgcgag gaaaggaatg gccagccaca 60
cottogogaa accogiggty goccaccagt cotaacggga caggacagag agacagagca 120
geoetgeact gtttteeete eaccacagee atectgteee teattggete tgtgetttee 180
actatacaca gicaccetec caatgagaaa caagaaggag caccetecac a
<210> 460
<211> 231
<212> DWA
<213> Homo sapiens
<400> 460
gcaggtataa catgotgcaa caacagatgt gactaggaac ggcoggtgac atggggaggg 60
cetaleacee tattetiggg ggetgettet teacagtgat catgaageet ageageaaat 120
eccaectere cacaegraca eggecageet ggagereaca gaagggteet cetgrageea 180
giggagetig giccagecte cagiccacee claccagget taaggataga a
<210> 461
<211> 231
<212> DNA
<213> Homo sapiena
<400> 461
cgaggtttga gaagetetaa tgtgeagggs ageegagaag caggeggeet agggagggte 60
```

```
gogtgtgctc cagasgagtg tgtgcatgcc agaggggaaa caggcgcctg tgtgtcctgg 120
gtggggttca gtgaggagtg ggaaattggt tcagcagaac caagccgttg ggtgaataag 180
agggggatto catggcactg atagageect atagttteag agetgggaat t
<210> 462
<211> 231
<212> DNA
<213> Homo sapiens
<400> 452
aggtaccete attgtagees tgggaaaatt gatgtteagt ggggateagt gaattaaatg 60
gggtcatgca agtataaaaa ttaaaaaaaa aagacttcat geecaatete atatgatgtg 120 ;
gaagaactgt tagagagacc aacagggtag tgggttagag atttccagag tcttacattt 180
totagaggag gtatttaatt tottotoact catcoagtgt tgtatttagg a
<210× 463
<211> 231
<212> DNA
<213> Homo sapiens
<400> 463
tactocaged tggtgacaga gogagacest atcacegeco eccaceceae caaaaaaaaa 60
actgagtaga caggtgteet ettggeatgg taagtettaa gteeceteec agatetgtga 120
cattegacag gesteette etetsgacet egststeece atetgastsa gaaaaggeag 180
tggggaggtg gatcttccag tcgaagcggt atagaagccc gtgtgaaaag c
<210> 464
c211> 231
<212> DNA
<213> Homo sapiens
<400> 464
gtactctaag attttatcta agttgccttt tctgggtggg aaagtttaac cttagtgact 60
aaggacatca catatgaaga atgtttaagt tggaggtggc sacgtgaatt gcaaacaggg 120
colycican tyactylyty colycaptro capriacter spartetyty teatrocapy 100
ggtgccageg caccagetag atgetetgta acttetagge cccattttcc c
<210> 465
<211> 231
<212> DNA
<213> Homo sapiens
<4D0 > 465
catgitgitg tagotgiggi aalgoigget gestoloaga cagggitaac ticagoloct 60
gtygcaaatt agcaacaaat totgacatea tatttatygt ttotgtatet ttgttgatga 130
aggatggcac aattitiget tgigticata atatacteag attagiteag etecateaga 180
taaactogas acatocassa cattagosta stottotago tottostaato a
<210> 466
<211> 231
<212> DNA
<213> Homo sapiens
<400> 466
caggiacete titecatigg atactgiget ageaageatg cietcogggg titittiaat 60
ggoottogaa cagaacttgo cacataceca ggtataatag titotaacat tigoccagga 120
cetytyczat caaatattyt gyagaattee etagetygag aagteacaaa gaetatzyge 180
aataatggag accastorea eaagatsaca accastostt ststsesset s
```

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<210> 467
  <211> 311
  <212> DNA
  <213> Homo sapiena
  <400> 467
 gtaraccotg gracagtora atrigaactg giteggract catotiticat gagatggatg 60
 tggtggettt teteettttt cateaagaet ceteageagg gageecagae cageetgeae 120
 tgtgccttaa cagaaggtot tgagattota agtgggaato atttcagtga otgtcatgtg 180
 geatgggtet etgeccaage tegtaatgag actatageaa ggeggetgtg ggacgteagt 240
 tgtgacctgr tgggcotocc aatagactaa caggcagtgr cagttggacr caagagaaga 300
 ctgcagcaga c
                                                                    311
 <210> 468
 <211> 3112
 <212> DNA
 <213> Homo sapiens
 <400> 468
 cattgtgttg ggagaaaaac agaggggaga tttgtgtgtgc tgcagccgag ggagaccagg 60
 aagatetgea tggtgggaag gaeetgatga taeagagttt gataggagae aattaaagge 130
 tggaaggcac tggatgcctg atgatgaagt ggactttcaa actggggcac tactgaaacg 180
 atgggatggc cagagacaca ggagatgagt tggagcaagc tcaataacaa aytggttcaa 240
 egaggaette gaattecate gagetegage teaagtttag eccaattett tactagttea 300
 ptgaatgtgg atgattggat gotcatttct catctctgag cctcaggttc cccatccata 360
 asstyggata cacagtatga totatasagt gggatatagt atgatotact toactgygtt 420
 attigaagga tgaattgaga taatttattt caggtgoota gaacaatgoo cagattagta 480
 catttggtgg aactgagaaa tggcataaca ccaaatttaa tatatgtcag atgttactat 540
 gettateett caateteata gittigteat ggeceaatti atecteacti gigeeteaac 600
 aaattgaact gitaacaaag gaatetetgg teetgggtaa tggetgagea ecaetgagea 660
 tttccattcc agttggcttc ttgggtttgc tagctgcatc actagtcatc ttaaataaat 720
 gaagttttaa catttetees gtgatttett tateteseet tegaagatae tatgttatgt 780
gattaaataa agaacttgag magaacaggt ttcattaaac ataaaatcaa tgtagacgca 840
astittetgg atgggeaata ettatgttea eaggaastge titaaaatat geagsagata 900
attaaatggc aatggacaaa gtgaaaaact tagacttttt ttttttttt ggaagtatct 960
ggatgtteet tagteaetta aaggagaaet gaaaaatage agtgagttee acataateea 1020
acctgtgaga ttaaggetet ttgtggggaa ggacaaagat etgtaaattt acagttteet 1000
tecasageca aegtegaatt tigasaesta teaaagetet tetteaagae aaataateta 1140
tagtacatet ttettatggg atgeaettat gaaaaatggt ggetgteaac atetagteae 1200
tttogetete aasatggtte ottttaagag aasgttttag apteteatat ttatteetgt 1260
ggaaggacag cattgtggct tggactttat aaggtcttta ttcaactaaa taggtgagaa 1320
ataagaaagg ctgctgactt taccatctga ggccacacat ctgctgaaat ggagataatt 1380
aacatcacta gaaacagcaa gatgacaata taatgtctaa gtagtgacat gtttttgcac 1440
atttecagee cetttaaata teeacacaca caggaageae aaaaggaage acagagatee 1500
ctgggagaaa tgcccggccg ccatcttggg tcatcgatga geetcgcect gtgcctggtc 1560
ccgcttgtga gggaaggaca ttagaaaatg aattgatgtg ttccttaaag gatgggcagg 1620
aaaacagato otgitgigga tattiattig aacgggatta cagattigaa atgaagicac 1680
aaagtgagca ttaccaatga qaggaaaaca gacgagaaaa tottgatggo ttoacaagac 1740
atgcaacaaa caaaatggaa tactgtgatg acatgaggca gccaagctgg ggaggagata 1800
accacgogge agagggteag gattetogge otgetgeeta aactgtoegt teataaccaa 1860
Abcattlest attictasee etessaseas agetgitgta atatetgate tetaeggite 1920
cttctgggcc caacattctc catatatcca gccacactca tttttaatat ttagttccca 1980
gatetgtact gigacettic tacactgtag aataaçatta eleatitigi tesaagacee 2040
ttogtgttgc tgcctaatet gtagctgact gtttttccta aggagtgttc tggcccaggg 2100
gatetytysa caggetyyya agcatetesa gatetteesa gygttataet taetageaca 2160
cageatgate attacggagt gaattateta atcazcatea teeteagtgt etttgeceat 2220
actgaaatte attteccaet titgigeees tietesagae eteasaatgi catteestta 2280
```

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tatcattaat goototttag tagittagag aaaxogtoaa aagaaatggo oocagaataa 240
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<213> Homo sapiene
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<400> 476

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<211> 140

<212> PRT

<213> Homo sapiens

<400> 477

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Leu Ser His Tyr His Arg Asp Thr Arg His His Thr Val Thr Trp Thr 35 40 45

His His Thr His Glu His Thr Asp Thr Lev Pro Tyr Gly His Trp 50 55 60

His Thr His Cys His Thr Val Thr Try Thr His Leu His Thr Ile Thr 65 70 75 80

Pro Pro His Thr Leu Pro Val Asp Thr Arg Thr His Arg His Cys His 95 90 95

Thr Asp Thr Gln Asn Thr Val Thr Arg Arg His His His Ala Asp Thr 100 105 110

Pro Pro Leu Trp Cys Arg Leu Asn Tyr Pro Ala Gly Gly Thr Ala Val 115 120 125

Ala Tyr Ser Cys Leu Ser Asp Trp Leu Ser Pro Gln 130 135 140

<210> 478

<211> 143

<212> PRT

<213> Homo sagiens

<400> 478

Met Tyr Arg His Thr Glu Thr Leu Pro His Gly Asp Thr Val Thr Gln

Ser His Gly His Thr Gly Ils Val Thr Trp Thr Asp Thr Gln Thr Tyr 20 25 30

Gly Glu Ile Thr Trp Thr His His His Thr Ile Thr Gly Thr Gln Thr

His Gly Asp Ile Thr Thr Trp thr His Cys His Thr Thr Thr Gly Thr 50 55 60

Arg Asp He Thr Leu Ser His Gly His Thr He Thr His Met Aon Thr 65 70 75 80

Pro Thr His Cys His Met Asp Thr Gly Thr His Thr Ala Thr Leu Ser 85 90 95 His Gly His Thr Ser Thr Pro Ser His His His Thr His Cyo Leu Trp
100 105 110

Thr Glo Gly His Thr Asp Thr Val Thr Glo Ile His Lys Thr Leu Ser 115 120 125

His Gly Asp Ile Thr Met Gln Ile His His His Ser Gly Ala Val 130 135 140

<210> 479

c211> 222

<212> PRT

<213> Homo sapiens

<400> 479

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5 10 15

Ser His Glu His Thr Gly Ile Val Thr Trp Thr Asp Thr Gln Thr Tyr
20 25 30

Gly Glu Ile Thr Leu Thr His His His Thr Ile Thr Gly Thr Gln Thr 35 45

His Gly App He Thr Thr Try Thr His Cys His Thr Thr Gly Thr
50 60

Arg Asp Ile Thr Leu Ser His Gly His Thr Ile Thr His Met Asn Thr 65 70 75 80

Pro Thr His Cys His Met Asp Thr Ala Thr His Thr Ala Thr Leu Ser 85 90 95

His Gly His Thr Ser Ile Pro Ser His His His Thr His Cys His Val

Asp Thr Arg Thr His Arg His Cys His Thr Asp Thr Gln Asn Thr Val

Thr Arg Arg His His His Ale Asp Thr Pro Pro His Gly His Ser Thr 130 135 140

Arg His Ser Ala Thr Gln Ile His His His Thr Glu Met Arg Thr His 145 150 155 160

Cys His Thr Asp Thr Thr Ser Leu Pro His Phe His Val Ser Ala 165 170 175

Gly Gly Val Gly Pro Thr Thr Leu Gly Ser Asn Arg Glu Ile Thr Trp 180 185 190

Thr Tyr Ser Glu Gly Lys Ile Phe Phe Tyr Phe Leu Gly Asn Gln Ala 195 200 205 .

Arg Leu Cys Leu Lys Lys Arg Lys Lys Lys Gln Tyr Thr Val 210 215 220

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<211> 144

<212> PRT

<213> Homo sapiens

<400> 480

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Cys Cys Leu Trp Gly Leu Gln Ser Leu Pro Gln Gly Ser Tyr Val Thr

Val Gly Phe Leu Val Val Lys Arg Gln Thr Ile Gly Arg Leu Glu Arg

Asp Phe Met Phe Lys Cys Arg Lys Cln Pro Cly Leu Pro Pro Ser Gly 50 55 60

Leu Cys Leu Leu Trp Pro Trp Pro Asn Leu Glu Phe Gly Arg Arg Gln 65 70 75 80

Asp Arg Leu Thr Trp Ser Ser Val Ser Val Ala Gly Val Cys Ala Cys 85 90 95

Arg Ala Arg Pro Gly Trp Leu Gly Glu Glu Pro Ala Thr Ser Ala Gly
100 105 110

Val Arg Leu Glu Glu Val Glu Glu Pro Pro Ala His Pro Leu Glu Glu 115 120 125

Ala Gly Val Ala Arg Phe Pro Arg Pro Glu Trp Val Pro Pro Asn Gly
130 135 140

<210> 481

<21i> 167

<212> PRT

<213> Homo sapiens

<400> 481

Met His Gly Pro Gln Val Leu Ala Arg Cys Ser Glu Cys Ala Cys Pro

Ala Leu Ala Ala Thr Ser Ala Gly Val Arg Leu Glu Gly Val Asp Arg
20 25 30

Pro Pro Thr Leu Pro Ser Gln Gly Ser Gly Trp Pro Cys Ser His Ser

Leu Ser Gly Cys His Leu Met Ala Asp Gly Ala Lys Ala Leu Gly Lys 50 55 60

Ala Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr Asp Val Pro

вD 75 70 65 Cys Pro Ala Ala Ser Glu Val Gly Gly Cys Ala Pro Ser Ser Trp Arg Ala Leu Ala Glu Val Thr Gly Cys Ser Leu Gly Pro Leu Gly Leu Als Gin His Ala Gin Ala Ser Val Leu Leu Leu Cys Tyr Lys Trp Ser His 120 Ils Gly Glu Thr Ser Ser His Leu Arg Ser Lys Val Tyr Ala Ala Phe 135 Gly Gly Ser Ser Pro Cys Leu Lys Gly Leu Met Ser Leu Trp Ala Ser 155 150 Trp Leu Ser Arg Gly Arg Pro 165 <210> 492 <211> 143 <212> PRT <213> Homo sapiens <4C0> 4B2 Met Glu Pro Tyr Arg Cly Asn Lys Lys Gln Val Gln Glu Lys Gly Val Pro Cys Leu Trp Cly Ser Ser Pro Cys Leu Arg Cys His Met Ala Leu Arg Ala Ser Trp Leu Pro Gly Gly Gly Pro Gln Ala Ile Leu Gly Arg Thr Leu Cys Ser Ser Ala Glu Ser Ser Gln Asp Cys His Pro Gly Gly Pro Ser lie Ala Leu Ala Lys Pro Cys Arg Gly Val Trp Leu Leu Phe Glu Pro Ala Trp Pro Pro Trp His Ala Arg Ala Pro Gly Ala Cly Thr Lou Leu Arg Val Cys Leu Ser Cys Leu Gly Cys His Leu Cys Gly Gly Ala Ser Gly Gly Gly Pro Ala Thr Asn Leu Thr Gln Ser Arg Lys Trp Met Ala Met Phe Pro Gln Pro Glu Trp Leu Pro Pro Asp Gly 140 135

<210> 483 <211> 143 <212> PRT

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<213> Homo gapiens
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<40D> 4B3

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Cys Cys Leu Trp Gly Ser Ser Pro Cys Leu Gly Ser Tyr Gly Thr Ala 20 25 30

Gly Phe Leu Val Ala Lys Arg Arg Thr Thr Gly Leu Leu Glu Glu Asp 35 40 45

Phe Thr Phs Lys Cys Arg Lys Gln Pro Lys Leu Pro Ser Met Arg Leu 50 55 60

Ser Leu Leu Trp Pro Trp Arg Asp Leu Lys Phe Val Pro Arg Gln Asp
65 70 75 80

Lys Leu Thr Arg Ser Ser Val Ser Val Ala Gly Ala Tyr Ala Cys Arg 85 90 95

Ald Gly Pro Gly Tro Leu Lys Glu Gln Pro Ale Thr Ser Ale Arg Val

Arg Leu Val Glo Ala Glu Ris Pro Pro Pro Ris Pro Leu Glu Glu Val

Gly Met Ala Arg Phe Pro Gln Pro Glu Cys Leu Pro Pro Tyr Cys 130 135 140

<210> 484

<211> 30

c212> PRT

<213> Homo Sapien

<400> 484

Thr Ala Ala Ser Asp Asn Phe Gln Leu Ser Gln Gly Gln Gly Phe

1 5 10 15 .
Ala Ile Pro Ile Gly Gln Ala Met Ala Ile Ala Gly Gln Ile
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<210> 485

<211> 31

<212> DNA

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<223> Made in a lab

<400> 485

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<210> 486

<211> 27

<212> DNA

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      <311> 36
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      <400> 487
                                                                        36
cecquattet tagetgeeca teegaacgee tteate
      <210> 486
      <211> 33
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     '<400> 488
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      <211> 19
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      <213> Artificial 9equence
      <220>
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      <400> 489
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Ser Val Ala
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      c211> 20
      c212> PRT
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      <223> Made in a lab
      <400> 490
Tyr Leu Ala Ser Val Ala Ala Phe Pro Val Ala Ala Gly Ala Thr Cys
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Leu Ser His Ser
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      <211> 20
      <212> PRT
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  Thr Gly Phe Thr
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       <211> 20
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 492
 Ala Leu Thr Gly Phe Thr Phe Ser Ala Leu Gln Ile Leu Pro Tyr Thr
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                                     10
 Leu Ala Ser Leu
             20
       <210> 493
       c211> 20
       <212> PRT
       <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 493
Tyr Thr Leu Ala Ser Leu Tyr His Arg Glu Lys Gln Val Phe Leu Pro
Lys Tyr Arg Gly
            20
      <210> 494
      <2115 20
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 494
Leu Pro Lys Tyr Arg Gly Asp Thr Gly Gly Als Ser Ser Glu Asp Ser
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Leu Met Ile Ber
           20
     <210> 495
     <211> 20
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<220>
      <223> Made in a lab
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Phe Pro Ass Gly
           20
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      <211> 21
      <212> PRT
      <213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 496
Ala Pro Phe Pro App Gly His Val Gly Ala Gly Gly Ser Gly Leu Leu
ı
Pro Pro Pro Pro Ala
           20
      <210> 497
      ₹211> 20
      <212> PRT
      c213> Artificial Sequence
      <220>
      <223> Made in a lab
      <400> 497
Leu Leu Pro Pro Pro Pro Ala Leu Cys Cly Ala Ser Ala Cys Asp Val
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                                     1D
ser Val Arg Val
            20
      <210> 498
      <211> 20
      <212> PRT
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       <223> Made in a lab
       <400> 498
Amp Wal Ser Wal Arg Wal Wal Gly Glu Pro Thr Glu Ala Arg Wal
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 Val Pro Gly Arg
             20
       c210> 499
       <211> 20
       <212> PRT
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  Ser Ala Phe Leu
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        <211> 20
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        <223> Made in a lab
        <400> 500
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                                      10
 Gly Ser Ile Val
              20
       <210> 501
       <211> 20
       <212> PRT
       <213> Artificial Sequence
       <220>
       <223> Made in a lab
       <400> 501
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                                     10
 Val Ser Ala Ala
             20
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       <211> 414
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ctgtagagtt tttggeatng acctmagtag caatgcaatg agetgggtom gemaggment
                                                                        120
                                                                        180
agggaagggg ctggaatgga tcggagccat tgataattgt ccacantacg cgacctgggc
                                                                       240
gaaaggccga ttnatnattt ccaaaacctn gaccacggtg gatttgaaaa tgaccagtcc
gacaarcgag gacacggeca ectatititg tggcagaatg aatactggta atagtggttg
                                                                       300
gaagaatatt tggggcccag gcaccctggt caccgtntcc tcagggcaac ctaa
                                                                       360
                                                                       414
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      <211> 379
      <212> DNA
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<213> Homo Sapiens
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      <221> misc feature
      <222> (1) ... (379)
      \langle 223 \rangle n = A,T,C or G
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                                                                        120
agctatggag tgagctgggt cogccaggct ccagggaagg ggctggmata catcggatca
                                                                        180
ttagtagtag tggtacattt tacgogaget gggcgaaagg ccgatteace atttecaaaa
                                                                       240
cotngaccae ggtggatttg aaaatcacca gtttgacaac cgaggacaeg gecaectatt
                                                                        300
Entgtgccag aggggggttt aattataaag acatttgggg cccaggcacc ctggtcaccg
                                                                        360
                                                                        379
tntecttagg gcaacetaa
      c210> 504
      <211> 19
      <212> PRT
      <213> Artificial Sequence
      <220>
      -223> Made in a lab
       <400> 504
Gly Phe Thr Asn Tyr Thr Asp Phe Glu Asp Ser Pro Tyr Phe Lys Glu
Asn Ser Als
       <210> 505
       <211> 2D
       <212> PRT
       <213> Artificial Sequence
       <22D>
       <223> Made in a lab
       <400> 505
Lys Glu Asn Ser Ala Phe Pro Pro Phe Cys Cys Asn Asp Asn Val Thr
                                      10
 Agn Thr Ala Agn
             20
       <210> 506
       <211> 407
       <212> DNA
       <213 > Homo Sapien
       <400> 506
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                                                                          δĐ
 togotggagg agtocggggg togotggte acgotggga caccotgae actoacotgc
                                                                         12D
 acceptetete gatteteect castageaat geaatgatet gggteegeea ggeteeaggg
                                                                         180
 aaggggetgg astarategg atacettagt tatggtggta gegeatacta egegagetgg
                                                                         240
 gtgaaaggcc gattcaccat ctccaaaacc tcgaccacgg tggatctgag aatgaccagt
                                                                         300
                                                                         360
 obgacaaccg aggacacggc cacctattto tgtgccagaa atagtgattt tagtggtatg
                                                                         407
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         <211> 422
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         <213> Homo Sapien
         <400> 507
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                                                                          120
  acagtetetg gattetecet eageaactac gacetgaact gggteegeea ggeteeaggg
                                                                          180
  aaggggetgg aatggategg gateattaat tatgttggta ggaeggaeta egegaattgg
                                                                         240
  geassaggce ggttcaceat etccaaaace togaccaceg tggatetcaa gatogceagt
                                                                         3 D O
  drgacaacry aggaracogr carriatte totocragas getggaagte coatgagtet
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  ggtccgtgct tgcgcatctg gggcccaggc accetggtca ccgtctcctt agggcaacct
                                                                         420
  аa
                                                                         422
        <210> 508
        <211> 411
        <212> DNA
        <213> Homo Sapiens
        <220>
        <221> misc_feature
        <222> (1)...(411)
        <223> n = A, T, C or G
        <400> 508
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                                                                         120
 castetetgg aategacete agtagetaet geatgagetg ggteegeeag geteeaggga
                                                                         180
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- דרגאנחפונה השל יחומחפאפדו

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Gly
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60D

660

720

765

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  Trp Val Lou Ser Ala Thr His Cys Phe Gln Asn Ser Tyr Thr Ile Gly
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                                       90
  Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
              100
                                   105
                                                       110
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                               120
  ser App Thr Ile Arg Ser Ile Ser Ile Ale Ser Gln Cyc Pro Thr Ale
                          135
                                               14D
  Gly Aen Ser Cys Leu Val Ser Gly Trp Gly Lsu Leu Ala Asn Gly Arg
                                          155
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  Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
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                                  185
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                                                                       480
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gtgtctttcg gaaaagecee gtgtggeeaa gttggegtge raggtgteta caccaacete

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45
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Trp Val Leu Ser Ala Ala His Cys Phe Gln Ann Ser Tyr Thr Ile Gly
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Lou Gly Leu His Ser Leu Glu Ala Asp Gln Glu Pro Gly Ser Gln Met
                                    ЭĐ
Val Glu Ala Ser Leu Ser Val Arg His Pro Glu Tyr Asn Arg Pro Leu
                                105
                                                    110
Leu Ala Asn Asp Leu Met Leu Ile Lys Leu Asp Glu Ser Val Ser Glu
                            120
        115
Ber Asp Thr lle Arg Ser Ile Ser Ile Ala Ser Gln Cys Pro Thr Ala
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                        135
Gly Asn Ser Cyc Leo Vel Ser Gly Trp Gly Leo Leo Ale Asn Gly Arg
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Met Pro Thr Val Leu Gln Cys Val Asn Val Ser Val Val Ser Glu Glu
                                    170
                L65
Val Cys Ser Lys Leu Tyr Asp Pro Leu Tyr His Pro Ser Met Phe Cys
                                185
Ala Gly Gly Gly Gln Asp Gln Lys Asp Ser Cys Asn Gly Asp Ser Gly
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Gly Pro Leu Ile Cys Asn Gly Tyr Leu Gln Gly Leu Val Ser Phe Gly
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<213> Homo sapiens

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- Met Tyr Val Val Ala Met Phe Gly Asn Cys Ile Val Val Phe Ile Val 35
- Arg Thr Glu Arg Ser Leu His Ala Pro Met Tyr Leu Phe Leu Cys Met 50 55 60
- Leu Ala Ala Ile Asp Leu Ala Leu Ser Thr Ser Thr Met Pro Lys Ile 55 70 75 80
- Leu Ala Leu Phe Trp Phe Asp Ser Arg Glu Ile Ser Phe Glu Ala Cyc 85 90 95
- Leu Thr Gln Met Phe Phe Ile His Ala Leu Ser Ala Ile Glu Ser Thr 100 105 110
- Ile Leu Leu Ala Met Ala Phe Asp Arg Tyr Val Ala Ile Cys His Pro 115 120 125
- Leu Arg His Ala Ala Val Leu Asn Asn Thr Val Thr Ala Glo Ile Gly
  130 140
- Ile Val Ala Val Val Arg Gly Ser Leu Phe Phe Phe Pro Leu Pro Leu 145 150 155 160
- · Leu Ile Lys Arg Leu Ala Phe Cys His Ser Asn Val Leu Ser His Ser 155 170 175
  - Tyr Cys Val Ris Gln Asp Val Met Lys Leu Ala Tyr Ala Asp Thr Leu 180 185 190
  - Pro Asn Val Val Tyr Gly Leu Thr Ala Ile Leu Leu Val Met Gly Val 195 200 205
  - Asp Val Met Phe Ils Ser Leu Ser Tyr Phe Leu Ils Ile Arg Thr Val 210 215 220
- Leu Gln Leu Pro Ser Lya Ser Glu Arg Ala Lya Ala Phe Gly Thr Cya 225 230 235 240
- Val Ser His Ile Gly Val Val Leu Ala Phe Tyr Val Pro Leu Ile Gly
  265 250 255
- Leu Ser Val Val His Arg Phe Gly Asn Ser Leu His Pro Ile Val Arg 260 265 270
- Val Val Met Gly Asp Ile Tyr Leu Leu Leu Pro Pro Val Ile Asn Pro 275 280 285
- Ile Ile Tyr Gly Ala Lys Thr Lys Gln Ile Arg Thr Arg Val Leu Ala 290 295 300
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 gettggggag actacgatga cagegootto atggatocca ggtaccaogt coatggagaa 240
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galgealgtg cgttaetgtt gctggaacal ggceclgalc caaataltcc agelgegtat 540
ggaastacca ctctacscts tgctgtctac satgsagsts asttsatggc cssagcactg 600
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Batgcgctgg atagatatgg aagaactgct ctcatacttg ctgtatgttg tggatcagca 780
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Pro Cys Cys Arg Gly Ser Gly Lys Ser Asn Val Val Ala Trp Gly Asp
Tyr Asp Asp Ser Ala Phe Met Asp Pro Arg Tyr His Val His Gly Glu
Amp Leu Amp Lys Leu His Arg Ala Ala Trp Trp Gly Lys Val Pro Arg
Lys Asp Leu Ile Val Met Leu Arg Asp Thr Asp Val Asn Lys Arg Asp
                                105
Lys Gln Lys Arg Thr Als Leu His Leu Als Ser Als Asn Gly Asn Ser
        115
                            120
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Asp Glu Cys Ala Leu Met Leu Leu Glu His Gly Thr Asp Pro Asm Ile
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Ser Lys Asn Lys His Gly Leu Thr Pro Leu Leu Leu Gly Ile His Glu
                        215
Gin Lys Gin Gin Val Val Lys Phe Leu Ile Lys Lys Lys Ala Asn Leu
                    230
                                        235
Asn Ala Leu Asp Arg Tyr Gly Arg Thr Ala Leu Ile Leu Ala Val Cys
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Cys Gly Ser Ala Ser Ile Val Ser Pro Leu Glu Glu Asn Val Asp
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Ala Lys Arg Pro Thr Thr Gly His Leu Glu Lys Glu Phe Met Phe His 50 55 60

Cys Arg Lys Gln Pro Gly Ser Pro Ser Arg Gly Leu Gly Leu Trp
65 70 75 80

Pro Trp Pro Asp Ile Glu Phe Val Pro Arg Gln Asp Lys Leu Thr Gln 85 90 95

Ser Ser Val Leu Val Pro Glo Ile Cyo Ala Cys Glo Thr Arg Pro Aso 100 105 110

Trp Leu Aso Glu Glo Pro Ala Thr Ser Ala Gly Val Arg Leu Glu Glu 115 120 125

Val Asp Gln Pro Pro Thr Leu Pro Ser Gln Gly Ser Gly Trp Pro Cys 130 135 140

Ser His Ser Leu Ser Gly Cys His Leu Met Ala Asp Ile Ala Lys Ala 150 155 160

Leu Gly Lys Ala Asp Gly Pro Trp Pro Tyr Leu Phe Val Arg Arg Thr 165 170 175

Asp Val Pro Cys Pro Ala Ala Ser Glu Val Gly Gly Cys Ala Pro Ser 180 185 190

Ser Trp Ris Thr Leu Ala Glu Val Thr Gly Cys Ser Leu Ser Pro Leu 195 200 205

Ser Leu Ala Gln His Ala Gln Ala Ser Val Leu Leu Cys Tyr Lys 210 215 220

Trp Ser His Ile Gly Glu Thr Ser Ser His Leu Arg Ser Lys Val Tyr 225 230 235 240

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<212> DNA

<213> Homo sapiens

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- Leu Val Phe Tyr Val Leu Val Asn Ser Ser Gln Thr Leu His Asn Lys 785 790 795 800
- Wet Phe Glu Ser Ile Leu Lys Als Pro Val Leu Phe Phe Asp Arg Asn 805 810
- Pro Ile Gly Arg Ile Leu Ann Arg Phe Ser Lya Ann Ile Gly Ria Leu 820 825 930
- Asp Asp Leu Leu Pro Leu Thr Phe Leu Asp Phe Ile Glm Thr Leu Leu 835 840 845
- Gln Val Val Gly Val Val Ser Val Ala Val Ala Val Ile Pro Trp Ile 850 855 860
- Ala Ile Pro Leu Val Pro Leu Gly Ile Ile Phe Ile Phe Leu Arg Arg 865 870 875 880
- Tyr Phe Leu Glu Thr Ser Arg Asp Val Lys Arg Leu Glu Ser Thr Thr 885 890 895
- Arg Ser Pro Val Phe Ser His Leu Ser Ser Ser Leu Gln Gly Leu Trp 900 905 910
- Thr Ile Arg Ala Tyr Lys Ala Glu Glu Arg Cys Gln Glu Leu Phe Asp 915 920 925
- Ala His Gln Asp Leu His Ser Glu Ala Trp Phe Leu Phe Leu Thr Thr 930 935 940
- 9¢r Arg Trp Phe Ala Val Arg Leu Asp Ala Ile Cys Ala Met Phe Val 945 950 955 960
- Ile Ile Val Ala Phe Gly Ser Leu Ile Leu Ale Lys Thr Leu Asp Ala 965 970 975
- Gly Gln Val Gly Leu Ala Leu Ser Tyr Ala Leu Thr Leu Met Gly Met 980 985 990
- Phe Gln Trp Cys Val Arg Gln Ser Ala Glu Val Glu Aan Net Net Ile

995 1000 1005

Ser Val Glu Arg Val Ile Glu Tyr Thr Asp Leu Glu Lys Glu Ala Pro 1010 1015 1020

Trp Glu Tyr Gln Lys Arg Pro Pro Pro Ala Trp Pro His Glu Gly Val 1025 1030 1035 1040

Ilt Ilt Phe Asp Asn Val Asn Phe Met Tyr Ser Pro Gly Gly Pro Leu 1045 1050 1055

Val Leu Lys His Leu Thr Ala Leu Ile Lys Ser Gln Glu Lys Val Gly
1060 1065 1070

Ile Val Gly Arg Thr Gly Ala Gly Lyc Ser Ser Leu Ile Ser Ala Lau 1075 1080 1085

Phe Arg Leu Ser Glo Pro Glu Gly Lys Ile Trp Ile Asp Lys Ile Leu 1090 1095 1100

Thr Thr Glu Ile Gly Leu Ris Asp Leu Arg Lya Lya Met Ser Ile Ile 1105 1110 1115 1120

Pro Gln Glu Pro Val Leu Phe Thr Gly Thr Met Arg Lys Asn Leu Asp 1125 1130 1135

Pro Phe Asm Glu His Thr Asp Glu Glu Leu Trp Asm Ala Leu Glm Glu 1140 1145 1150

Val Glo Leu Lys Glu Thr Ile Glu Asp Leu Pro Gly Lys Met Asp Thr 1155 1160 1165

Glu Leu Ala Glu Ser Gly Ser Asn Phe Ser Val Gly Gln Arg Gln Leu 1170 1180

Val Cys Leu Ala Arg Ala Ile Leu Arg Lys Asn Gln Ile Leu Ile Ile 1185 1190 1195 1200

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Leu Gln Gly Phe Trp Asp Lys Glu Val Leu Arg Ala Glu Asn Asp Ala 20 25 30

Gln Lys Pro Ser Leu Thr Arg Ala Ile Ile Lys Cys Tyr Trp Lys Ser 35 40 45

Tyr Leu Val Leu Gly Ile Phe Thr Leu Ile Glu Glu Ser Ala Lys Val Ile Gln Pro Ile Phe Leu Gly Lys Ile Ile Asn Tyr Phe Glu Asn Tyr Asp Pro Met Asp Ser Val Ala Leu Asn Thr Ala Tyr Ala Tyr Ala Thr 90 Val Leu Thr Phe Cys Thr Leu Ile Leu Ala Ile Leu His His Leu Tyr 105 Phe Tyr His Val Glm Cys Ala Gly Met Arg Leu Arg Val Ala Met Cys 120 His Met Ile Tyr Arg Lys Ala Leu Arg Leu Ser Asn Met Ala Met Gly 135 Lys Thr Thr Thr Gly Gln Ile Val Asn Leu Leu Ser Asn Asp Val Asn 155 150 Lys Phe Asp Gln Val Thr Val Phe Leu His Phe Leu Trp Ala Gly Pro 170 165 Leu Gin Ala Ile Ala Val Thr Ala Leu Leu Trp Met Glu Ile Gly Ile 185 Ser Cys Leu Ala Gly Met Ala Val Leu Ile Ile Leu Leu Pro Leu Gln Ser Cys Phe Gly Lys Leu Phe Ser Ser Leu Arg Ser Lys Thr Ala Thr 215 Phe Thr Asp Ala Arg Ile Arg Thr Met Asn Glu Val Ile Thr Gly Ile Arg Ile Ile Lya Met Tyr Ala Trp Glu Lys Ser Phe Ser Asn Leu Ile 250 Thr Asn Leu Arg Lys Lys Glu Ile Ser Lys Ile Leu Arg Ser Ser Cys

Leu Arg Gly Met Ann Leu Ala Ser Phe Phe Ser Ala Ser Lys Ile Ile Val Phe Val Thr Phe Thr Thr Tyr Val Leu Leu Gly Ser Val Ile Thr Ala Ser Arg Val Phe Val Ala Val Thr Leu Tyr Cly Ala Val Arg Leu Thr Val Thr Leu Phe Phe Pro Ser Ala Ile Glu Arg Val Ser Glu Ala 345

Ile Val Ser Ile Arg Arg Ile Gln Thr Phe Leu Leu Leu Asp Glu Ile

- Ser Gln Arg Asn Arg Gln Leu Pro Ser Asp Gly Lys Lys Met Val His 355 360 365
- Val Gln Asp Phe Thr Ala Phe Trp Asp Lys Ala Ser Glu Thr Pro Thr 370 375 380
- Leu Gln Gly Leu Ser Phe Thr Val Arg Pro Gly Glu Leu Leu Ala Val 385 390 395 400
- Val Gly Pro Val Gly Ala Gly Lys Ser Ser Leu Leu Ser Ala Val Leu
  405 410 415
- Gly Glu Leu Ala Pro Ser His Gly Leu Val Ser Val His Gly Arg Ile 420 425 430
- Ala Tyr Val Ser Gln Gln Pro Trp Val Phe Ser Gly Thr Leu Arg Ser 435 440 445
- Ash The Let Phe Gly Lys Lys Tyr Glu Lys Glu Arg Tyr Glu Lys Val 450 455
- Ile Lys Ala Cys Ala Leu Lys Lys Asp Leu Cln Leu Clu Asp Cly
  465 470 475 480
- Asp Leu Thr Val Ile Gly Asp Arg Gly Thr Thr Leu Ser Gly Gly Gln 485 490 495
- Lys Ala Arg Val Asn Leu Ala Arg Ala Val Tyr Gln Asp Ala Asp Ile 500 505 510
- Tyr Leu Leu Asp Asp Pro Leu Ser Ala Val Asp Ala Glu Val Ser Arg .515 520 525
- His Leu Phe Glu Leu Cys Ile Cys Gln Ile Leu Ris Glu Lys Ile Thr 530 535 540
- Ile Leu Val Thr His Gln Leu Gln Tyr Leu Lys Ala Ala Ser Gln Ile 565 550 555 560
- Leu Ile Leu Lys Asp Gly Lys Met Val Gln Lys Gly Thr Tyr Thr Glu 565 570 \$75
- Phe Leu Lys Ser Gly Ils Asp Phe Gly Ser Leu Leu Lys Lys Asp Asn 580 585 590
- Glu Glu Ser Glu Gln Pro Pro Val Pro Gly Thr Pro Thr Leu Arg Asn 595 600 605
- Arg Thr Phe Ser Glu Ser Ser Val Trp Ser Gln Gln Ser Ser Arg Pro 610 620
- Ser Leu Lys Asp Gly Ala Leu Glu Ser Glu Asp Thr Glu Ash Val Pro
- Val Thr Leu Ser Glu Glu Asn Arg Ser Glu Gly Lys Val Gly Phe Gln 645 650 655
- Ala Tyr Lya Asn Tyr Phe Arg Ala Gly Ala His Trp Ile Val Phe Ile

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Авр	Trp 690	Trp	Leu	ser	Tyr	Trp 695	Ala	ABD	ГÀВ	Gln	3er 700	Met	Leu	Asn	Va.
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Thr	Leu	H1a 755	Asn	Lys	Mec	Phe	Glu 760	Ser	Ile	Leu	Lys	Ala 765	Pro	Val	Lei
Phe	Phe 770	Двр	Arg	aba.	Pro	Ile 775	GJY	Arg	Ile	Leu	Asn 780	Yrg	Phe	Ser	Lyı
<b>Азр</b> 785	Ile	Gly	His	Leu	<b>Asp</b> 790	Asp	Leu	Leu	Ртф	Leu 795	Thr	Phe	Lęψ	Asp	P04
Ile	Gln	Thr	Leu	<b>Le</b> u 805	Gln	Val	Val	Gly	Val 810	Val	Ser	Val	Ala	Val 815	Ala
Val	Ile	Pro	Trp \$20	Ile	Ala	Ile	Pro	Leu 825	Val	Pro	Leu	Gly	11e 830	Ile	Phe
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	850				_	855					860			ser	
B65					B70					875				Arg	881
				885					890					Т <del>гр</del> 895	
			900					905					910	Ala	
Сув	Ala	Met 915	Phe	Val	Ile	Ile	Val 920	Ala	Phe	Gly	Ser	Leu 925	Ile	Leu	Ale
Lув	Thr 930	Leu	Asp	Ala	Gly	Gln 935	va1	Gly	ren	Ala	101 940	ßer	ТУТ	Ala	Lei
945			-		950		_	-		955				Glu	960
Glu	ABD	Met	Met	11s 965	3er	Val	Glu	Arg	Val 970	Ila	Glu	Tyr	Thr	Авр 975	Lev

- Glu Lys Glu Ala Pro Trp Glu Tyr Gln Lys Arg Pro Pro Pro Ala Trp 980 985 990
- Pro His Glu Gly Val Ile Ile Phe Asp Asn Val Asn Phe Met Tyr Ser 995 1000 . 1005
- Pro Gly Gly Pro Leu Val Leu Lys His Leu Thr Ala Leu Ile Lys Ser 1010 1015 1020
- Gin Glu Lys Val Cly fle Val Gly Arg Thr Gly Ala Cly Lys Ser Ser 1025 1030 1035 1040
- Leu Ile Ser Ala Leu Phe Arg Leu Ser Glu Pro Glu Gly Lys Ile Trp 1045 1050 1055
- Ile Asp Lys Ile Leu Thr Thr Glu Ile Gly Leu His Asp Leu Arg Lys
  1060 1065 1070
- Lys Met Ser Ile Ile Pro Gin Giu Pro Val Leu Phe Thr Gly Thr Met 1075 1080 1085
- Arg Lys Asn Leu App Pro Phe Asn Glu His Thr Asp Glu Glu Leu Trp 1090 1095 1100
- Asn Ala Leu Gln Glu Val Gln Leu Lys Glu Thr Ile Glu Asp Leu Pro 1105 1110 1115 2120
- Gly Lye Met Asp Thr Glu Leu Ala Glu Ser Gly Ser Asn Phe Ser Val 1125 1130 1135
- Gly Gln Arg Gln Leu Val Cys Leu Ala Arg Ala Ile Leu Arg Lys Aen 1140 1145 1150
- Gln Ile Leu Ile Ile Asp Glu Ala Thr Ala Asn Val Asp Pro Arg Thr 1155 1160 1165
- Asp Glu Leu Ile Gln Lys Lys Ile Arg Glu Lys Phe Ale His Cys Thr 1170 1175 1180
- Vol Leu Thr Ile Als His Arg Leu Asn Thr Ile Ile Asp Ser Asp Lys 1195 1190 1195
- Ile Met Val Leu Asp Ser Gly Arg Leu Lys Glu Tyr Asp Glu Pro Tyr 1205 1210 1215
- Val Leu Leu Gln Asn Lys Glu Ser Leu Phe Tyr Lys Met Val Gln Gln 1220 1225 1230
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